



# STARLIMS™

TECHNICAL NOTE

## Web Services

Collaboration Platform

### What are Web Services?

Web services are a new breed of web applications. They are self-contained, self-describing modular applications that can be published, located, and invoked across the web. Web services perform functions which can be anything from simple requests to complicated business processes. Once a web service is deployed other applications, independent of the language they were written in and of the platform they reside on, can discover and invoke the deployed service.

### Why Web Services?

A major part of today's IT budgets are dedicated to solving integration issues including interfacing between LIMS and other key business applications.

For seamless interoperability between laboratories and the enterprise STARLIMS deploys the web service approach. This allows for arbitrary applications running on multiple operating systems, developed in numerous programming languages, to communicate without concern to the other system's internal implementation.

This approach permits organizations and their IT vendors to completely separate the business rules and functionality from the presentation tier thereby enabling each group to select the most appropriate presentation tools for the task. As a result, the enterprise's dependency on complex custom integration projects is lowered and costs of ongoing maintenance of interfaces are dramatically reduced. Given that future IT platforms support XML, web services secure client knowledge bases for years to come.

Each client application can utilize STARLIMS web services using its own standard libraries and functions. Legacy systems that do not naturally support usage of web services may use the STARLIMS SOAP Client, which can be accessed by any Windows automation clients such as VB, C, C++ Excel, and Delphi. STARLIMS Web Services framework exposes key LIMS elements such as Sample Login, Results Entry and a variety of information distribution capabilities.

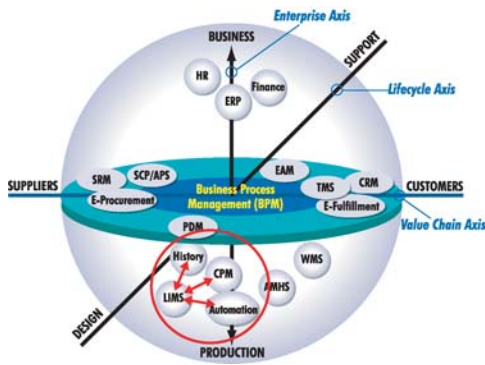
### Usage Examples

#### 1. Release of Quarantined Raw Material

In this scenario the MRP system would connect to a web service published by STARLIMS called "SampleLogin" and provide it a DTO (Data Transfer Object) that includes the relevant information about the sample that needs to be logged such as Material Name, Supplier and Lot#.

The service then performs all the required STARLIMS transactions involved in the sample login process hiding the complexity of the process from the requesting application.

Upon release of the batch STARLIMS connects to a web service published by the MRP called "UpdateLotStatus" providing it a DTO that contains the Lot# and Status.



Enterprise IT Sphere by ARC Advisory Group

Web Services extend STARLIMS functionality from the laboratory to the entire supply chain.

## 2. Provide Access to Quality Data

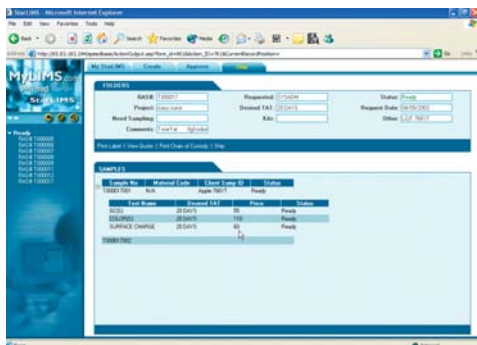
STARLIMS family of “GET” services eliminates the need for the calling application to understand, STARLIMS’ underlying database structures or to be concerned with changing database structures.

For example a corporate portal responsible for displaying trends in final product quality will continuously poll the “GetLotQuality” web service designed to return a data set listing Product – Lot – Status – Quality.

## 3. myLIMS

STARLIMS’ myLIMS enables an efficient and secure relationship with remote customers, suppliers or data clients allowing them to pre-login samples, view testing status, print COAs, invoices and more via an integrated browser based solution.

The underlying technology uses ASP pages that consume web services for execution of business logic thus totally separating the presentation tier from the business tier.



myLIMS.com

## 4.XML Forms to Pre-Log Samples

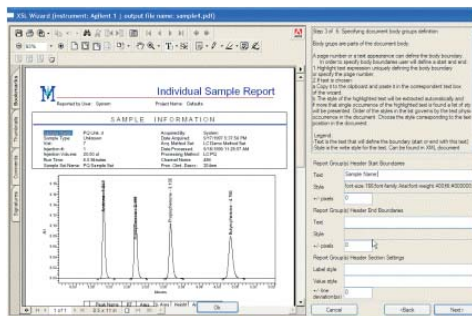
The XML Sample Login form shown below is downloaded from the organization’s portal by invoking the STARLIMS service named “RequestLoginForm”. The form is filled online or optionally offline and then submitted back to another STARLIMS service named “SampleLogin” which reads the DTO stored within the form and creates a STARLIMS sample.



Login Form

## 5. Instrument Interfacing

The instrument report shown below was generated as a PDF and transmitted to a web service called “ResultsCapture”. The web service converts the PDF to an XML file, parses the required information (sample info and results) from the XML file, updates the STARLIMS databases with results and routes the original instrument output for storage in STARLIMS Document Management application.



Parsing Wizard

## Summary

STARLIMS Web Services cohesive integration power can greatly enhance operational efficiency. Benefits include:

- Leveraging LIMS traceability functions to enterprise data.
- Minimizing integration costs.
- XML founded solution future-proofs knowledge base.
- Advanced instrument integration.

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