ELisA: the ATLAS logbook facility extensions

Electronic Logbook for the information storage of ATLAS

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Abstract

ELisA is a web tool used by the ATLAS experiment at CERN LHC to keep track of the daily activities of the experiment's operations, commissioning and deployment work. The logbook is used by the system operators, experts and automated services to record and share information.

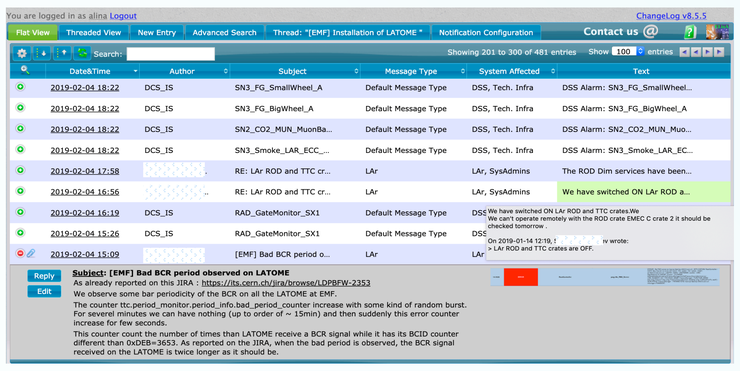
Introduction

We developed a highly configurable electronic logbook tool for the ATLAS experiment at CERN LHC. It comprises a web application, a REST API server, and a set of client libraries.

The logbook is in production since 2012, and it was exclusively used during LHC Run 2 operations after the previous elog utility has been dismissed early 2014. Developed primarily as the experiment's operations logbook, it was adopted quite quickly as the logging tool for different standalone activities such as detector development and commissioning work. Thus, the need for a more straightforward tool setup and deployment outside of the ATLAS working environment appeared, the final goal would be to offer the users an entirely out-of-the-box logbook utility.

Constituents: Web interface

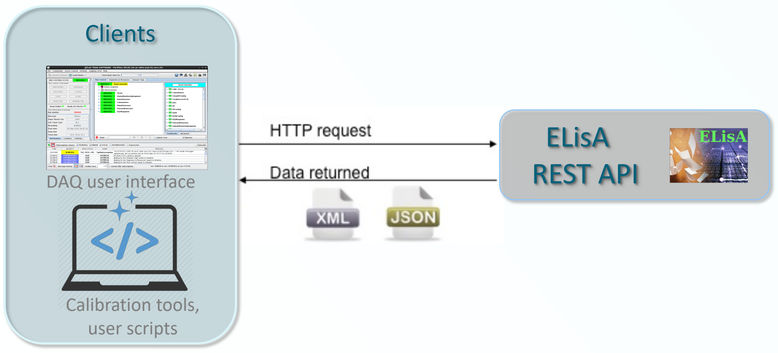
ELisA is a Spring framework-based **web application**, following the Model-View-Controller (MVC) design pattern [1]. It offers a user-friendly web interface to browse and search activity logs (called entries), to download attachments, to add, update or reply to logs entries [2]. ELisA privileges client-side processing for message visualization (usage of the DataTables plugin [3]) and uses AJAX techniques to retrieve data on client request asynchronously. The logbook configuration and the data entries are stored in an Oracle database (the choice of database technology was limited to ensure the portability of the old data).



Constituents: REST API

ELisA also provides a **REST API** to its functionality, i.e., an HTTP-based interface to create, access and modify entries. For each client HTTP request, the REST API server responds with a structured XML or JSON representation of a resource. The model objects are mapped to the structure of the Oracle database used for storage. The Spring framework is used for implementation, and the model classes are using JSR-303 annotations for data validation and JAXB annotations for the marshaled XML structure. The REST API server clients are the tools and services of the data acquisition software infrastructure as well as user-developed web pages and dedicated scripts.

ELisA REST API is exposed to Python, Java, and C++ via **dedicated client libraries**. Also, a set of **command line utilities** are available on top of the Python client API library to provide developers with a programmatic-free facility to perform the most common logbook operations.



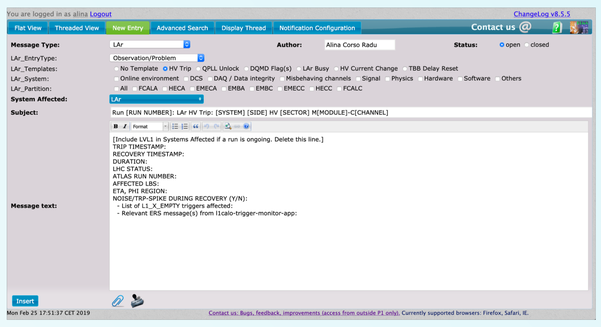
The logbook provides a handy **email notification mechanism** fully configurable depending on different entry properties, e.g., message type, system affected, or based on a specific option. A specific tab on the web interface can be used to query the notification configuration. Also, a reply-to utility is available to insert into the logbook a reply to a given entry directly from the user's preferred mail client, without using the web interface.

The logbook has restricted access to authenticated users only. A **double authentication mechanism** is implemented: first based on CERN SSO for usage on the CERN General Public Network with a fail-over mechanism based on LDAP server for usage inside the restricted ATLAS Technical and Control Network.

Latest improvements

Editor templates

ELisA allows for pre-made, fixed templates to be automatically loaded into the entry editor in case of recurrent problems for which entries need to be posted. The format is thus standardized, and all the desired information is requested explicitly. This approach makes the logbook information more thorough, more consistent, and, ideally, quicker to post. The templates are configurable depending on specific entries properties.



Support for multiple logbooks

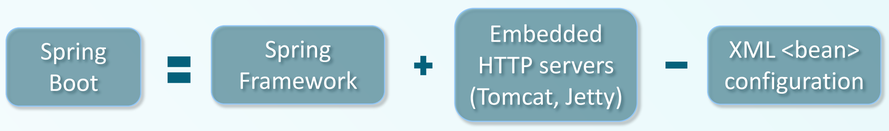
Though initially the logbook was developed for ATLAS experiment's operations, requests from different sub-systems for private tool usage started to be gathered. Therefore development was done to support configurations for multiple logbooks stored in the same Oracle database which is managed by CERN IT department. A switch-startup page was implemented to help the user to choose the right logbook.

Support for multiple databases technologies

One of the private logbook setup problems is the usage of the centralized Oracle database. Therefore one way to improve the setup was to implement support for another SQL database. We chose MySQL which is easy to install and configure for a user. Support for PostgreSQL will be added as well.

Migration to Spring Boot [5]

As we are looking for ways to improve the deployment process, the migration to Spring Boot seems to be the right approach as it helps to automate configuration and deployment while making it easier to implement features. Additionally, Spring Boot reduces the XML configuration almost entirely, making development more straightforward. Spring Boot also provides Tomcat server embedded into the framework reducing maintenance work.



Deployment

The product is stable and mature enough, being in production for a few years already. No performance issues have been observed during the whole LHC Run 2 operations period. One server instance is enough to ensure logbook high-availability and good scalability, and user-friendly experience when accessing the logbook functionality.

Currently, five different logbook setups are deployed within the ATLAS experiment and two setups are used by the ProtoDUNE experiment, and few more are expected to be setup and deployed in the near future.

Conclusion

We developed a web facility for the electronic logbook used by the ATLAS experiment. We are implementing solutions to address the portability of the logbook as it started to be used as well in private setups outside its initial scope. We are adding support for other database technologies to remove the dependency from Oracle database. We are reducing the deployment dependencies and maintenance by using Spring Boot utilities. These developments will improve the setup and deployment of the logbook.

References

1. http://www.springsource.org/
2. Electronic Logbook for the Information Storage of ATLAS Experiment at LHC: J. Phys.: Conf. Ser. 396 (2012) 012014
3. http://www.datatables.net/
4. The ELisA Facility – RESTful API and Client Libraries: 2013 NSS/MIC 10.1109/NSSMIC.2013.6829714
5. http://spring.io/projects/spring-boot

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