THE ELECTRONIC LOGBOOK @ THE TTF VUV-FEL MAKING THE NEXT STEP

R. Kammering*, O. Hensler*, A. Petrosyan† and K. Rehlich*

Abstract

Now more than three years have past since the first introduction of the electronic logbook (*e-LogBook*) at DESY Hamburg. Triggered by the positive response from the various user sides, the e-LogBook is now no longer only used at the TESLA Test Facility (TTF) [1] at DESY, but also at a variety of other facilities (e.g.: Low Level RF, Cavity test stands, vacuum) and even different institutes (e.g.: SLAC (USA), INFN (Italy) and NSRRC (Taiwan)).

The introduction of the e-LogBook has fostered a new working culture in the daily accelerator operation. This triggered some extensions and changes within the original e-logbook concept, like e.g.: accessing the e-LogBook from outside the hosting institute.

After a brief introduction to the basic technology of the TTF e-LogBook, the extensions and changes to the original concept will be given. Furthermore the experience gathered from the last year's e-LogBook operation will be discussed to give an evaluation of the general usability of these web-services in the particle accelerator sector.

INTRODUCTION

In the year 2001 the controls group of the TTF1 decided to set up an electronic version of the usual shift logbook that is commonly used (or even required at some facilities). This decision has been made since a paper based version of such a logbook lacks a number of requirements to be fulfilled if one wants to do remote operations. Some of the advantages of an electronic logbook are:

- it makes remote shifts possible
- it can be made accessible for everyone
- be **the** common place for measurement results

After an initial testing phase of the e-LogBook in the real TTF operation, the operators quickly noticed that the electronic logbook version has many advantages and completely stopped using the "old" paper based version. Therefore we are now running the e-LogBook at the rebuild TTF (now called TTF VUV-FEL) facility for already more than three years. It has gained a very broad acceptance not only within the TTF VUV-FEL operation team, but also for many people who are not that deeply involved in the operations.

But the TTF e-LogBook did not only gain great acceptance within the DESY, but also at a number of external institutes even from other countries. So we will not focus on the TTF e-LogBook technology itself since this has already been discussed elsewhere (see e.g. [2]), but instead will have a look to the various implementations and the requirements one has to meet to fulfil the different needs.

SOME STATISTICS

The TTF e-Logbook has been introduced at the TTF in autumn 2001. Up till now about 37 thousand entries have been made and approximately 18GB of graphical and 25MB of textual data has accumulated in the TTF e-LogBook.

One can see a more or less exponential rise in the number of users accessing the central TTF VUV-FEL e-LogBook machine (see figure 1). This should roughly correspond to the general usage of the e-LogBook (not only TTF since our central e-LogBook server machine is serving a number of other e-LogBooks).

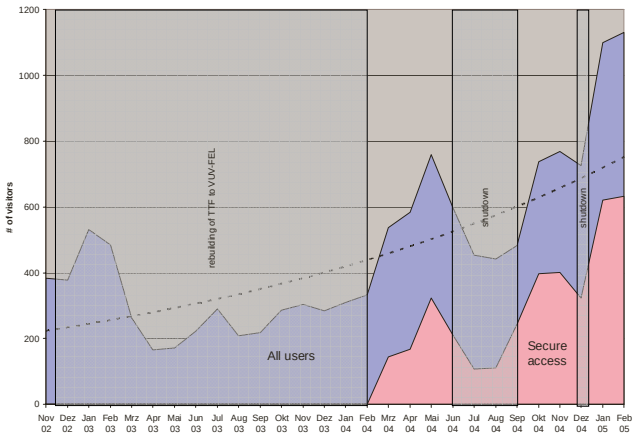

Figure 1: Number of unique users per month accessing the central TTF VUV-FEL e-LogBook server. The shaded areas are times at which the machine has been shut down.

The usage development for the TTF e-LogBook is in agreement with the experience we also gained from the huge number of requests for copies of the TTF e-LogBook. Today roughly 30 e-LogBooks of the TTF type are running on approximately a dozen different server world wide (see figure 2). The current version of the e-LogBook can easily be installed on any Linux distribution and on SUN OS (this is the platform on which it had originally been developed). This year we started to work on an easy to use automatic installation procedure, which is a quit hard task since the e-LogBook is composed out of a number of very different software components (e.g. the search engine: Core C, interface JAVA servlets, GUI JAVA server pages). Here we need to get as many responses as possible to collect all system dependencies which need to be taken into account. This way we should be able to further harden the automatic installation to run reliable on any Linux distribution.

*DESY Hamburg.
†Yerevan Physics Institute

Figure 2: Snapshot of a TTF e-LogBook running traditional Chinese characters (thanks to J. Tsai for providing me this snapshot).

CHANGES SINCE THE FIRST VERSION

Apart from support and developments for installing the TTF e-LogBook on different platforms, we have ported all HTML code to JSP (Java server pages – for all Java related terms see [3] for details) to allow parameterization of e-LogBook specific values to e.g. select different layouts or even different languages for two e-LogBooks running on the same server. This is accomplished be use of JSTL (Java Server Pages Standard Tag Library) by which one is able to directly parse and import values from a e.g. given configuration file.

Further did we implement JDBC (Java database connectivity) support to allow direct storing of main machine parameters and standard shift settings (like names of the shift crew, goals, achievements etc.). This allows the operators to do most of the standard documentation from within the e-LogBook environment.

SECURITY

Since TTF and also TTF VUV-FEL have been built up be an international collaboration already from the first days of the TTF e-LogBook there has been big interest for external access to the DESY e-LogBooks. Since the main TTF computer cluster is based on Sun Solaris (partly running quite outdated operating system versions), we had to bridge a gap between the "old fashion" NIS (Network Information Service – also known as *Yellow Pages* or YP). Since we need to keep the central services running NIS we decided to set up an additional naming service which is updated from the (main) NIS database. Because most of the web related services take LDAP (Lightweight directory access protocol) as the default, we decided to also go for LDAP.

Within the LDAP structure *roles* are created. These roles are now used to allow access to a specific web resource (e.g. access to e-LogBook A). After this these roles can be applied to a user who wants to access a web resource. The general architecture is sketched in figure 3.

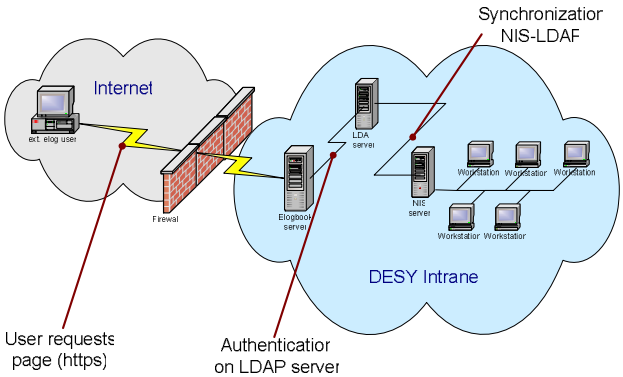

Figure 3: Sketch of the architecture for external access to the TTF e-Logbooks.

If a user tries to access a secured web resource, the e-LogBook server will whether he is already authenticated and will redirect the user to a login page if not. The procedure is shown in figure 4. Here we gain form using JSP instead of HTML since one can directly integrate the login and logout functionality into the JSP pages (see figure 4).

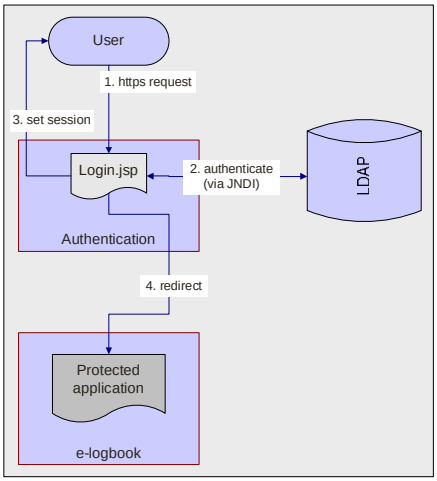

Figure 4: Login procedure for external access to the TTF e-LogBook.

Up till now a user would have to authenticate itself again if he wants to access a second (secured) web application. We are going to switch to the so called *single sign on* (SSO) procedure as sketched in figure 5. Here a so called Identity server is intercepting the connection between the LDAP server and the e-LogBook server. If now a user tries to access a secured web resource policy agents called modules will redirect the login attempt to the identity server which holds the state for a given user (at a given IP address). Did the user already authenticate itself before (and no timeout driven invalidation occurred), this will be known at the identity server which in turn will return that the user is already authenticated. The policy agent propagates this information further to the e-LogBook server which will now grant access to the web application. The integration of this SSO services into our existing infrastructure could be done without touching the general authentication concept (NIS syncs to LDAP) and

can easily be plugged into our existing web infrastructure (policy agents are available as standalone modules for e.g. Apache httpd or Apache Tomcat).

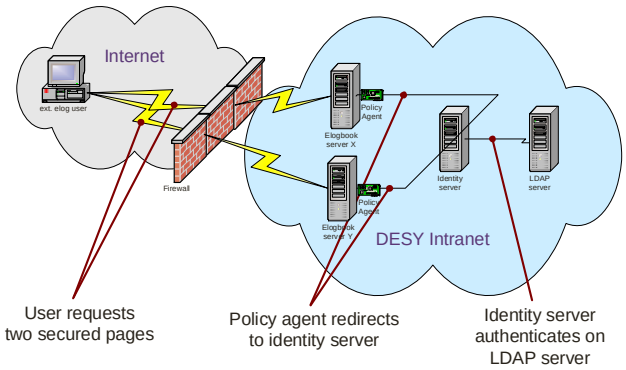

Figure 5: Possible single sign on (SSO) architecture.

CONCLUSIONS

In the past three years we have seen that the acceptance for this technology is really overwhelming. Therefore the ease for cloning of one e-LogBook has been a high priority and will most probably remain so.

One equally important area is for sure the accessibility from external (e.g. collaboration partner) side. Since there is more than one web service involved in the operation of the TTF VUV-FEL (there are already several e-LogBooks with close relation to the TTF VUV-FEL operation), it is not feasible to again and again request authentication from hundreds of users. So we will definitely put big effort in limiting the number of authentications to a minimum whereby these procedures must still prove to meet all security aspects (like SSL encryption strength, duration of certificate validity, etc.)

Overall the general usability of web technologies in the area of particle accelerator control systems could be proven by the TTF e-LogBook technology and one might expect a lot of new developments and improvements within this sector in the near future. This should strongly urge all people working in these areas to think about founding collaborations.

REFERENCES

[1] See e.g.: http://tesla.desy.de
[2] Proceedings of the PCaPAC 2002 (WEO2)
[3] See http://www.sun.com