HS.REGISTER

HS.REGISTER is a technology that aims to create a single audit log for healthcare institutions by aggregating heterogeneous events from many different heterogeneous log sources (syslog, log4j, HL7, web server logs, etc). Our solution is compliant with the IHE-ATNA profile (*Audit Trail and Node Authentication* **) and allows an Institution to perform complex auditing processes that cross different systems in an integrated way, as well as diagnose complex problems using a simple web application.**

◇ CHALLENGES

In a current hospital environment where **Health Information Systems** (HIS) are daily tools that support the clinical practice, any problem can cause more than simple delays. The HIS are becoming ever more specialized, leading to a high need for interoperability between various applications. The high degree of interoperability combined with a diversity of applications, and service providers, makes it increasingly difficult to find the cause of a problem in one of the applications, since this may be an error in integration, infrastructure or even a software update. Any log systems analysis can take hours or days, even with help of the various system suppliers responsible for each one of the deployed application**. Which of your applications can be inactive for a day without generating panic in the services?**

With the sheer number of applications in hospital environments, it is not easy to keep track of activity within systems, "*Is the person who logged into the workstation the same person who logged into the imaging application at that workstation*?". Health data sensitivity issues related to security incidents and an increasing dependence on systems overall performance, makes the public trust and the Hospital capacity to cope and at the same time reduce operational costs, heavily dependent on the institutional capacity to put in place a fully traceable system for the actions of the various stakeholders participating in the entire health process. **HS.REGISTER** aims to empower health institutions with a system that:

— facilitates compliance with the rules defined in the GDPR (European Data Protection General Regulations)

— be comparable to ATNA systems (Audit Trail and Node Authentication)

— facilitates the BSHI certification process (Brazilian Society of Health Informatics)

◇ OUR SOLUTION

Our solution maintains a central repository based on elastic search, where all Hospital overall important events are registered.

HS.REGISTER presents itself as a way of performing complex correlation analysis of many different events, in applications environments with high heterogeneity of applications. This allows the centralization and subsequent analysis of different types of events such as:

— Events related to authorization and authentication;

— Errors and logs of various services and systems;

— HL7 and Web API (Rest/SOAP) messages.

Once centralized, these events can be later analyzed over time and indexed by patient, health care professional, workstation IP number, department among others. This repository can also be used as a source of data for business process alarmistic and monitoring dashboard systems, making the system administration response to incidents faster and much more efficient by not requiring the user communication to detect operational problems.

◇ HS.REGISTER BENEFITS

— Compliance with legal obligations to trace clinical information
— 1st line IT support Interface
— Data production for provider's support levels (SLA) control
— **Integrated exploitation** of events that have multiple computer platforms
— Consistent temporal information assurance

◇ ARCHITECTURE

HS.REGISTER is easily adaptable to many different environments, with configurations that require few resources for small/medium institutions, and high availability cluster based configurations with their own high capacity storage, capable of storing very large amounts of information while still maintaining high performance, for the largest of Hospitals.

The exploration application allows to abstract the users from all the indexing and search functionalities of the repository through a simple web interface that goes straight to their searching and incident analytical needs. For more advanced uses there is an advanced search module where the user has access to a rich set of analytical features that can take full advantage of the elastic search based comprehensive event repository.
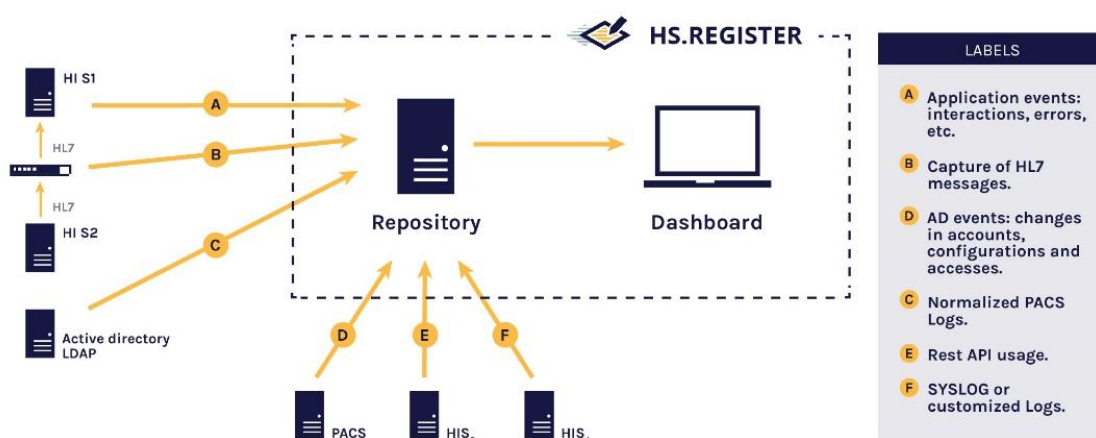
◇ SUCCESS STORIES

IPO Porto Oncology Hospital

HS.REGISTER receives events related to:

- HL7 messages of laboratories, Imaging, Radiotherapy and Admission-Discharge-Transfer;
- LDAP/Active Directory events;
- Acess to Institucional Portal;
- Tomcat applicational servers' events;
- Glassfish applicational servers' events.

The visualization of these logs is done in a fast and integrated way, allowing a very effective audit by the IT technicians of the hospital.

Entre Douro e Vouga Hospital Centre

HS.REGISTER receives events related to:

- HL7 messages of laboratories, Imaging, Radiotherapy and Admission-Discharge-Transfer;
- Hospital Clinical Registry events, called Medtrix ;
- Pathologic Anatomy software events;
- PACS imaging system events.