

# Students' Mobility: STORK project deployment

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## 1. ABSTRACT

Providing e-services on a federated environment requires a hard and trustable authentication scheme, traditional methods such as username and password have become obsolete as far as there is no centralized database to check against, furthermore, additional data associated with the actor who is being authenticated can be required for the process. Identity management solves this by providing strong authentication and attribute management capabilities.

This paper describes STORK's Students mobility pilot, including project planning, definition of the common specification layer, technologies that implement the interoperability layer and tasks oriented towards the integration, testing and tuning of the authentication mechanisms of Universitat Jaume I into STORK's common interoperability layer.

In addition, it considers the results and benefits expected during the running and monitoring of the real life pilot that is taking place within June 2010 and May 2011.

## 2. Background

Secure idenTity acrOss boRders linKed (STORK) is a project co-funded by the European Commission as a part of its Competitiveness and Innovation Programme (CIP) in order to address, in a cross-border scenario, the identity management problem. This project brought together in its first phase 14 countries and 29 consortium partners mixing public and private sector organizations. Five new member states have incorporated to the STORK consortium in a second phase.

University Jaume I is leading the student mobility pilot on behalf of "Conferencia de Rectores de Universidades Españolas" (CRUE) which will allow students to perform some formalities through a web portal despite of their location.

Student mobility pilot, covered in this paper, is one of the five projects deployed in order to test a common interoperability layer built within the Large Scale STORK Pilot. The other projects are:

- Cross border Authentication for Electronic Services.

The objective of this pilot is to prove that existing national services can interoperate across borders. It will enable existing national online services in one or more participating Member States to connect to existing national electronic identity services in other participating Member States. The online services that are part of this pilot are the national portals of Austria, Estonia, Germany, Portugal and the Limosa service, which enables compliance for the right to work in Belgium.

- SaferChat.

The SaferChat pilot will demonstrate a more secure social networking environment, where venues for collaboration and communication are tailored to students aged 14-18 and their educators.

The Safer Internet Nodes in Austria and Iceland are actively involved, with their respective Youth Panels playing important roles as focus groups involved in testing and piloting. Furthermore, several schools are already participating in the SaferChat project and are involved in the pre-pilot preparations and tests. A widely-spread and accepted open source e-learning framework (Moodle) that provides many features in order to fulfill the requirements for this pilot, such as resource sharing or chat modules has been selected as the demonstrative application for chat rooms and school projects. A special connector and plug-in for connecting this e-learning framework to STORK has already been developed and is being tested, while a chat room module has also been adapted. The e-learning application has been deployed in a test environment, bringing this pilot closer to its effective launch.

- eDelivery.

This pilot will enrich selected eDelivery portals of Slovenia, Estonia and Austria with STORK authentication components. As a result, citizens from other Member States will be able to login, register and pick-up deliveries at these eDelivery portals by using their own domestic eID tokens.

Public authorities of one Member State will be able to send documents to recipients in another Member State using their domestic eDelivery system. This cross-border eDelivery framework is going to be piloted between Austria and Slovenia. This pilot will start testing at the beginning of June 2010. Currently, the pilot is deploying and testing the developed technical components in connection with the existing national infrastructure of STORK's partners.

- Change of Address.

The Change of Address Service enables citizens to electronically change/update their addresses in the participating Member states.

The challenge is ensuring the service obeys the requirements of each Member State's local law and internal processes while at the same time allowing for EU-wide interoperability. Once updated in other Member States, the change of address can be communicated to several entities of the citizen's choice. All participating Member States recently agreed upon the chosen format for the Address Declaration, in order to allow automatic and/or manual processing. Currently, the participating Member States are in the final stages of development for all the necessary services, with the test phase shortly following.

### **3. STORK PROJECT DEPLOYMENT: STUDENTS MOBILITY PILOT**

The student mobility pilot aims to solve some of the current mobility problems. The idea behind this is to provide a common framework in order to interoperate among different entities. This framework will be provided by the STORK project, allowing universities to use it in order to get identity proofs. When a student wants to apply for an e-service offered by a university different from his or her own, this university will get the student's authentication data and will send them to the STORK backbone to get an identity proof. The participant universities will provide e-services to students from abroad facilitating cross-border mobility a pan-European higher education environment. The pilot is focused on students moving to a foreign European University, with the 'Erasmus' registration procedure having been selected as the main application for the pilot

### **4. Technology overview**

Providing e-services to authenticated users over a corporate controlled intranet is solved by Single Sign On Systems where the authentication procedure is centralized and the control over it remains on the organization but when the set of users that can access to these e-services comes from external sources the organization has no control, the authentication procedure must be delegated to the organization who has this control, that is named Identity Federation and one of the basis upon the STORK project is constructed. The main idea behind Identity Federation is to delegate the authentication procedure against the involved party who has control over the validation of the

authentication data. This party is commonly known as Identity Provider and could offer an Identity proof -That is a yes/no answer to the question, is the user authenticated?- or in addition, an authenticated attribute set could also be offered by the identity provider. For example, the address of a person, the telephone or the date of birth will be possible attributes.

In order to get these identity proofs and the attributes, an open XML based standard is used, SAML. The authenticated data is signed using the XML Signature specification so authenticity and integrity are assured.

From the STORK point of view, we can find the next components that compose the full Identity Federation infrastructure:

- E-service  
It is the service delivered to the end-user and where he or she wants to get authenticated in order to get some benefits.
- S-PEPS  
When an organization wants to authenticate an external end-user, it must know where the request must to be addressed, this mapping is stored in the S-PEPS (Source Pan-European Proxy Service) that will be the part involved into user's redirection towards C-PEPS.
- C-PEPS  
Once the authentication is sent to the C-PEPS (Colleague Pan-European Proxy) this component will redirect the request to the final IDP.
- IDP  
The IDP authenticates the user and gives an identity proof as a response.

Regarding STORK, each country is named Member State and has a PEPS used for interaction between them.

## **5. Students mobility as a paradigm of pan-European interoperability**

The STORK framework will encapsulate the procedure to have the students' identity checked against the country or university of origin and to get it back to the university of destination, which will be able to decide whether the e-service should be provided or not. From the student's point of view, the whole procedure can be performed from its origin country or university. Authentication is not the only goal of the pilot, as the STORK infrastructure also provides authenticated attributes, and thus, some extra data can be used with full guarantee by eService providers.

That will allow systems from different universities to interact to each other without any access or implementation restrictions that is the classic definition of interoperability. The interoperability could be achieved in two formal classifications:

- Syntactic Interoperability  
That is the systems exchange information with a predefined data structure, communication protocols, etc. In case of STORK Syntactic Interoperability is achieved by using an XML based standard (SAML) to interchange the authentication data over a common transport layer (HTTPS).
- Semantic Interoperability  
Semantic Interoperability is referred to the ability of interpret the information interchanged in an automated form. For example, in a scenario where a consumer university wants to know if a foreign student has a bachelor's degree, the identity provider could offer such attribute that will be automatically interpreted by the consumer university system allowing the student to perform the required procedure.

For this interaction, four universities from different European countries (Italy, Austria, Portugal and Spain) are directly involved in the pilot together with the Estonian institution in charge of providing services for registration and access to higher education. However the participation is open for any university willing to join the project. In Spain, there are at least seven universities which are going to benefit from the pilot through CRUE and RedIRIS.

## 6. Use cases under test

The project started on June 2008 defining the scope of the pilots and it is scheduled to go live during June of the present year (2010). As a result, a limited set of common use cases were selected in order to be implemented by any participant university. These use cases are:

- Erasmus enrolment and pre-enrolment procedures: an Erasmus student will be able to get enrolled or pre-enrolled from his origin country through the STORK infrastructure.
- Foreign students/citizens registration to specific courses: some universities allow citizens and students, with no further requirements than checking their identity, to access specific courses. Pre-enrolment to these courses is also included in the pilot.
- Access to on-line services through SSO mechanisms: in addition to the enrolment or pre-enrolment procedures, universities participating in the pilot offer some services focused in the student relationship with the institution. The access to the e-services provided by the universities is also considered within the use cases.

Regarding the use cases, there are some challenges to overcome when doing them automatically and in a cross border way. The first problem to solve is the administrative procedure, universities have their admission procedures very well defined and the new procedure must fit totally the administrative requirements. Each university has its own admission procedure and, thus, they must evaluate if the new procedure meets their own rules.

Secondly, the identity must be checked in a secure and trustable way, the identity providers must perform correctly and the information given must assure its authenticity and integrity. The attributes related to this identity are also really important as far as they will be the only data used into the used e-service.

During the first phase, universities will only be attribute consumers, requesting the attributes needed to the citizen's origin countries through the S-PEPS - C-PEPS - IDP interaction, but the STORK infrastructure also consider to interact with universities turning them into an attribute providers, thus in the first phase only some set of attributes could be interchanged, see table 1, but in a second phase a wider set of attributes could be consumed by universities, i.e. imagine that an Austrian citizen, a student from Graz University of Technology wants to get enrolled into a master's degree course at University Jaume I in Spain, the University Jaume I must know that the incoming student has finished a bachelors degree first and this could be an attribute that will be asked by University Jaume I, using the STORK infrastructure, to the Graz University.

Table 1. Attributes offered by each country IDP.

Austria	Estonia	Italy	Portugal	Spain
Last name	Last name	Last name	Full name	ID
First name	First name	First name	Date of birth	Given name
Date of birth	Date of birth	Date of birth	National Id number	Surname
A unique sectorial ID	National ID number	Place of birth		Family name
	Gender	Address		Gender
		Fiscal code		Date of birth
		Sex		Nationality
				Canonical Residence Address
				Text Residence Address
				email Address
				Age
				Is Age Over

## 7. A Working Test Example (fonoteca @ uji.es).

The Student Mobility pilot is in its testing phase, at University Jaume I, a very early integration is done with the “fonoteca” service, a service that allow students to listen to a wide set of music stored at University servers. This test is a prototype and is only delivered to the service developers in order to test the SIR (Identity Service from RedIRIS, the Spanish academic and research network) that connect the university to STORK, the process is shown at Figure 1.

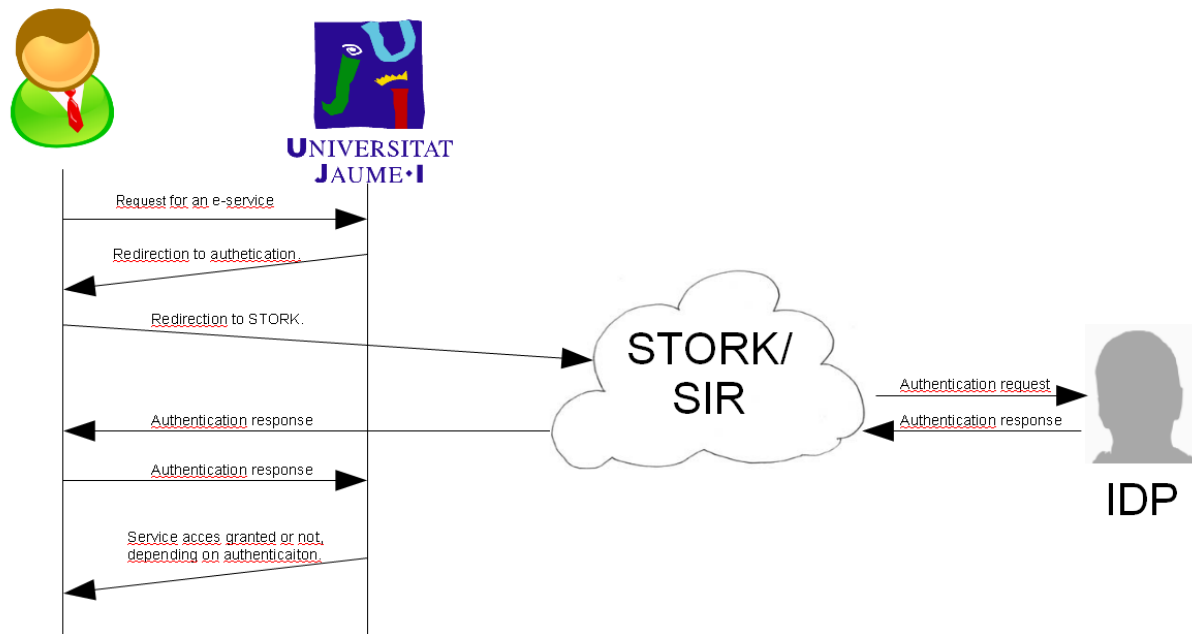


Figure 1. User authentication for an e-service.

The first step is the user request for an e-service application, in the fonoteca test case, this is done in the main page that can be seen in the figure 2.

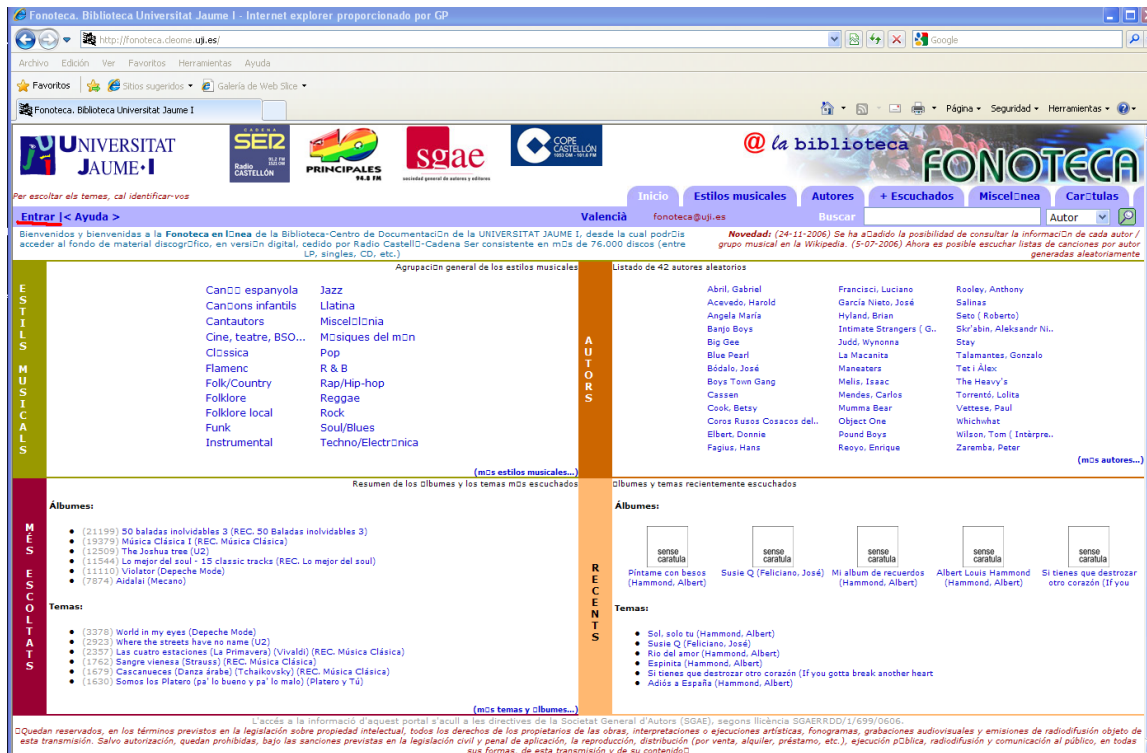


Figure 2. E-service page.

When the user request access to the service, he or she is redirected to an authentication page where he or she can choose whether to authenticate using the local SSO or an external provider as shown in figure 3.

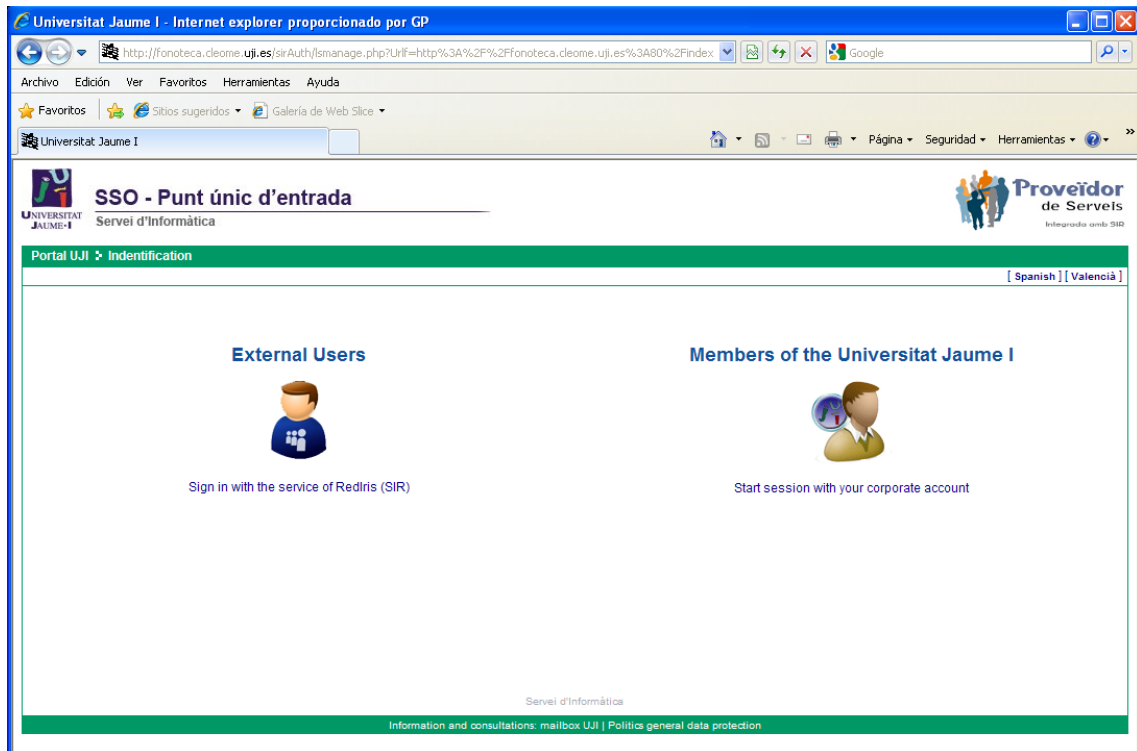


Figure 3. Authentication method.

Once the user has chosen the external authentication method, a page is displayed by the SIR in order to allow him or her to choose its origin country, figure 4 illustrate this process.

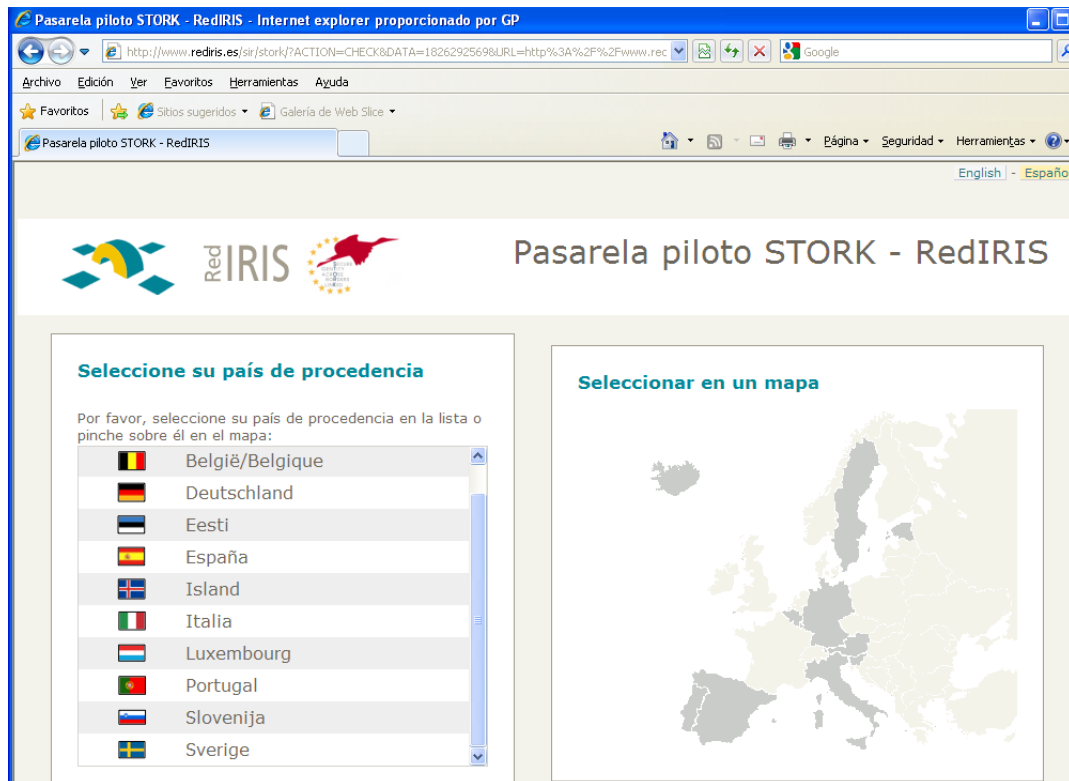


Figure 4. Country of origin selector.

When the student select its origin country, he is finally redirected through STORK to its identity provider in order to perform the authentication, in this example a Portuguese authentication has been chosen as the figure 5 shows.

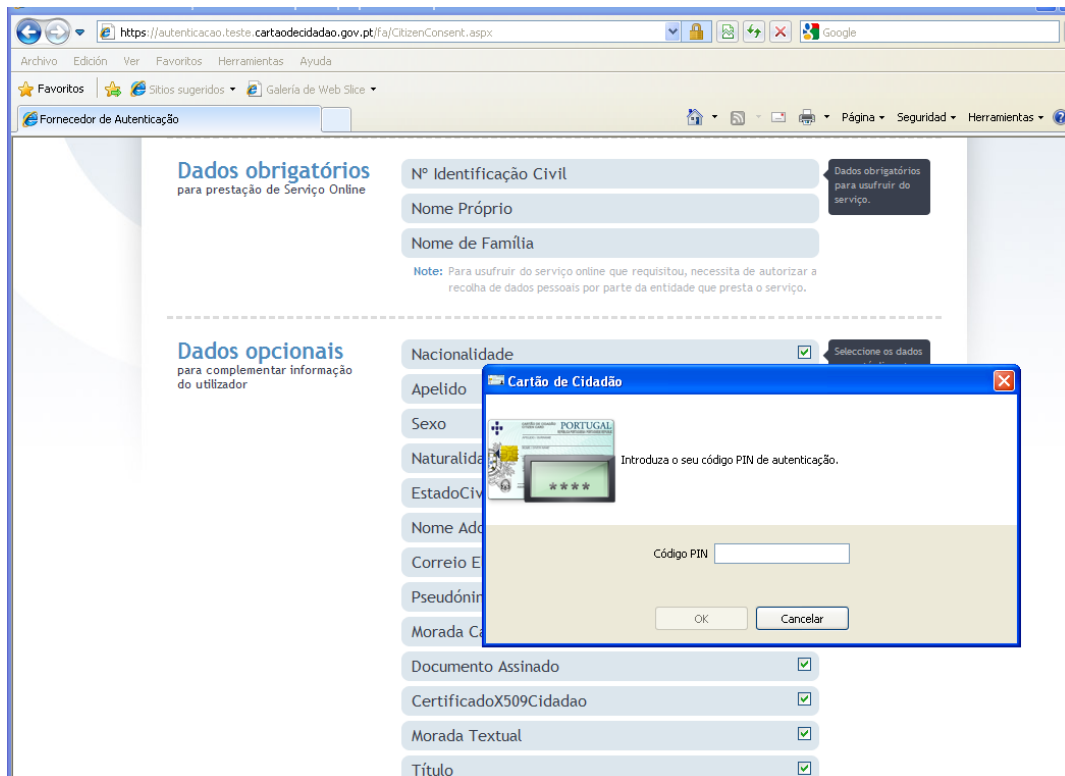


Figure 5. Authentication and attribute selection.

And finally the user is redirected through the STORK back to the e-service provider who receives the authentication data and attributes. An important remark, from a privacy point of view, here is that the user always has to give permission over the authentication and the attributes that will be transferred in a transparent way, thus he will always know the information that is going to be transferred about him or her.

## 8. Extension and future.

The infrastructure will not be limited to the use cases mentioned in point 5. Any university is free to adapt STORK to other services depending on the internal organization, the degree of integration of authentication procedures and the attributes available.

Any university of Europe is encouraged to integrate to the STORK infrastructure, their first step should be to adapt its own SSO system to be able to delegate the authentication to a national PEPS, an interesting model is the Spanish SIR where a connector component hides the particularities of the national PEPS, or any other IDP, offering to any university an easy and feasible way to use any identity provider that is registered in the SIR service.

In the future universities could be also attribute providers so the interchange of authenticated data will not be limited to an authentication and personal data but data about the degrees coursed, academic records, prizes, grants, etc. could be offered by a origin university with the student consent eliminating formalities on the destination university being able to perform any procedure from its origin country. This will contribute to the European Higher Education Area within the context of Bologna process promoting mobility and homogenization of procedures between European universities.



## **9. RISKS**

As any other project, this pilot is not free of any risk, the main problem we are facing thinking on the deployment is not to find the sufficient amount of Erasmus students participating in the project. The student not only has to be an Erasmus student but he or she has to own an enabled eID from its origin country that it is enabled on STORK. That can reduce a lot our target group of participants.

Another risk the pilot is facing relates to the maintenance of the deployed components, a big infrastructure has been created and a lot of resources has been assigned to develop the specific member state and universities infrastructures, all these components will have to be maintained and more resources coming from the European Commission will be necessary in order to evolve and maintain the project.

## **10. STUDENTS ENGAGEMENT**

Student's mobility pilot is especially interesting to test the whole STORK project due to the specific targeted group of users. The group of users that can access to the services is previously determined, because they are students, and it is relatively easy to contact to them and encourage them to participate through special programs.

Furthermore, a set of actions will be performed in order to engage the students, the most notable ones are the organization of workshops where users will receive a gift and a certificate to assist, also the students that have shown interest to study in a foreign university could receive a brochure where the stork advantages will be explained and some articles will be sent to the press media in order to spread the pilot awareness within the student community.

## **11. CONCLUSIONS**

We can conclude that the Student's Mobility Pilot is a key pilot regarding the testing of the whole STORK infrastructure because of its targeted set of users.

Also, the deployment of this pilot will, in the nearer future, eliminate formalities within the university engagement procedures allowing students to apply from a specific service from anywhere just having his or her enabled eID. Also the evolution of the project relies on the continuous adoption of eIDs by the European countries provoking a growth in the potential user set.

Finally the infrastructure will be a key factor regarding the interoperability between the different public administrations and European companies that could take profit of the authentication procedures in order to offer their services to a wider set of users.

## 12. REFERENCES

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