



European Translational Information and Knowledge Management Services

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Service Wrapper around eTRIKS providing data management services to EU Translational Research

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2 Introduction

Previous deliverables¹ summarizing the steps of design and deployment of the eTRIKS platform have already presented various parts of the eTRIKS service delivery platform. This deliverable describes the service management “Wrappers” that have been deployed around the underlying services and that have been put in place to encapsulate access and administration to the many technical and functional services that comprise the eTRIKS platform.

3 Executive Summary

The intent of eTRIKS is to provide easy and controlled access to data and applications that enable for Translational Research. This document provides a description of the wrappers developed around data management services. These wrappers include a dashboard user interface, which mediates the access to data and application, as well as tools that encapsulate all the steps to deploy access and security modules around the data. There are three classes of wrappers currently deployed:

- A category intended for the users to provide them with simplified access to the eTRIKS services.
- A category that is specifically built for administrators to help them with standard and controlled deployment of the eTRIKS services on local or remote sites.
- A category is that of wrappers allows projects to have an eTRIKS-flavoured deployment of any application to be easily portable to any other site.

4 Inputs and outputs from related deliverables

Previous deliverables, D1.7, D1.2 and D1.1 have covered the design, setup and operation of the eTRIKS platform that correspond to the milestones 1.1 to 1.4. The present deliverable shows how this acquired knowledge is consolidated in specific wrappers that allow better and more automated deployment of the platform.

¹ Deliverables D1.7, D1.2 and D1.1

5 Description of Work Achieved

5.1 Services wrappers for Users and Projects

Services wrappers developed by eTRIKS for users and projects are accessed through a unique portal, portal.etriks.org. It has been developed by eTRIKS and has been evolving ever since, as new services are being offered to the community. We can divide the services in 2 broad categories, one for all end users, and the other for the privileged users, like for example the project owners that are responsible for giving the adequate level of access to each of the end users.

5.2 Wrappers for user functionality access

The public server and each of the projects being officially supported by eTRIKS are provided with a specific frame on the service portal that encapsulates all their functionalities.

The hidden layers behind each wrapper include in general security layer, data hosting layer, software deployment layer with performance and high availability tuning, etc.

Example in figure 1 of the frame dedicated to the Public Server shows that in a few clicks, information on the hosted data, access to eTRIKS-flavour of tranSMART application and monitoring of the performances is available.

The public server

Public server provides you with a large variety of studies ranging from **demographic, clinical information** and **microarray gene expression data**. All this data can be viewed with tranSMART or Galaxy application tools. The data is extracted from public data repositories and **curated by eTRIKS** before being made available on the public server. Click on the right hand side widget to explore these datasets using the eTRIKS platform.

Want to see which studies are available to you?

Want to know from which public repository the studies are originating from?

Public Server

Services :

- Production tranSMART v1.2
- Monitoring dashboard

Production Platform Version:

- eTRIKS Platform version: 2.0
- tranSMART core version: 1.2.2
- R version: 3.0.1

Figure 1: Wrapper to access Public Server data and application

5.3 Wrapper for projects owners: registration and validation

eTRIKS members have to be duly registered to access eTRIKS services. Likewise, for each project, new members that would like to join the collaboration to benefit

from its services need to be acknowledged and registered. This requires a procedure of validation involving the responsible of each project (owner) to validate their own members. For both purposes, a multi-step wrapper has been developed to hide the complexity of the security and authentication operations. It will allow the owner to receive the new user registration, decide whether to validate them, and tune the privileges of the newcomers according to their role.

5.4 Service wrappers for Administrators

As was already described above, the eTRIKS platform is a multi-layered platform. When it was put in place, the concept of modularity and service modules was adopted so that an entire module could be deployed more than once.

Wrappers for service deployment

A wrapper to deploy each service module was implemented and is evolving as the platform or the module itself evolves. It is very useful to be able to reproduce easily a tested and validated configuration. Ansible² playbook technology was chosen as the deployment-automation language/tool/framework.

If we take an example corresponding to the tranSMART VM (Virtual Machine) on which the client can connect to visualize his data and make his analysis, this module will be built using the main following playbook ansible files:

- A playbook file to build the Database Infrastructure
- 3 main playbook files to build in the application: one for tranSMART software, one for R server, one HA (High Availability) playbook file to provision tranSMART with as many R resources as necessary to run efficiently.
- 2 playbook files to ensure the VM security: one for the LDAP server, and one for the client server.

One of the strengths of this system is that all these wrappers can be used to deploy the same platform at any other site, for example University of Luxembourg or Imperial College London, provided they have a Cloud-based architecture.

Wrappers for service portability

² <http://www.ansible.com>

Providing a large size, general purpose and reliable platform cannot be designed the same way as a specialized service running on standalone. This is why we provide also another type of wrapper that will allow any project or any user of a project to deploy a specific module of the platform (for example eTRIKS-flavour of tranSMART in its own remote environment). We have chosen for that Docker³ container technology.

For example, a dockerfile is available to anyone to generate a ready-to-go container for eTRIKS-flavour of tranSMART. Embedded in this dockerfile are the automatic setup of all the dependences, all the best practices and performances improvements that have been tuned on the main platform. Figure 2 shows the corresponding widget on the service portal.

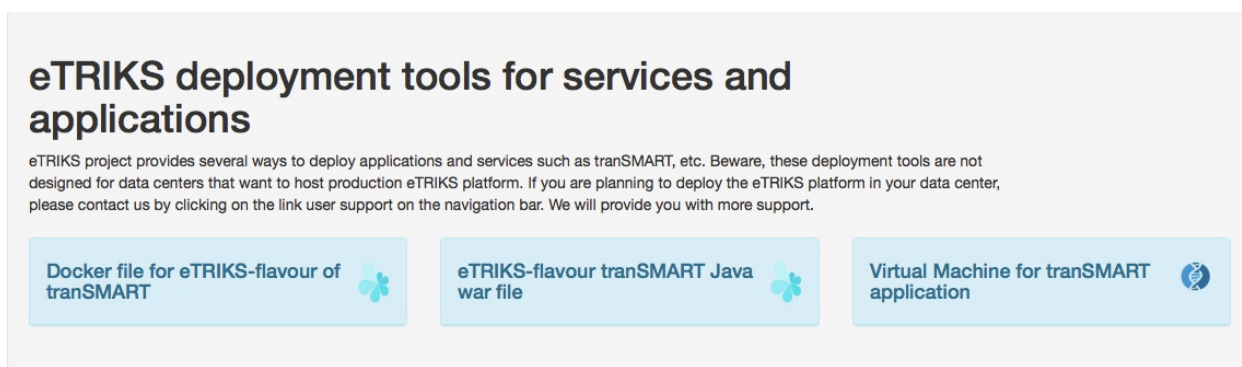


Figure 2: Frame on the portal to access wrappers for remote installation. First widget is the docker containment of eTRIKS-flavor of tranSMART

6 Conclusion

eTRIKS has developed different wrappers based on robust and sustainable technologies that can be reused on any remote platform. They provide a customized and easy-to-use access to all the services that contribute to an effective EU Translational Research.

7 List of abbreviations

VM: Virtual Machine
HA: High Availability

³ <https://www.docker.com>