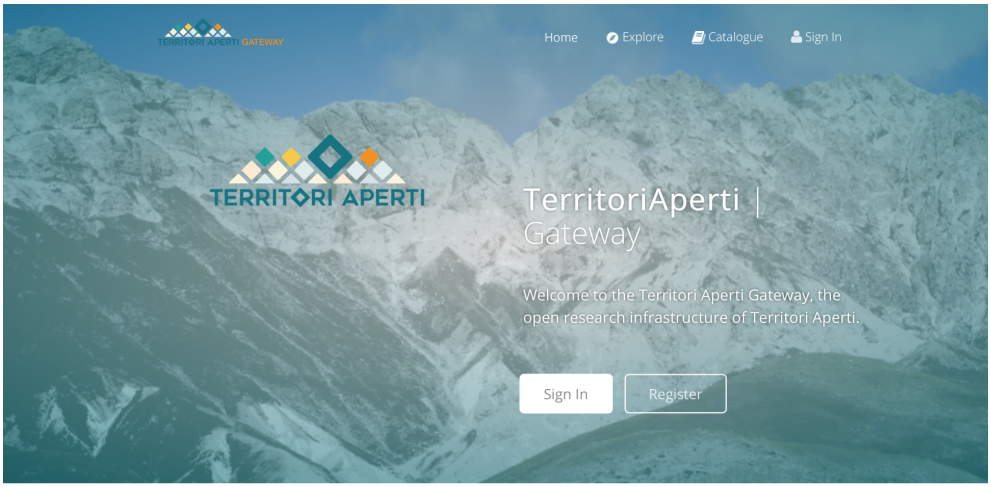
Territori Aperti

Report #2

June 29th, 2021



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Date	***Description***	***Author***	***Version***
03.06.2021	*Initial draft and introduction*	*D4Science*	*0.1*
15.06.2021	*Description of services*	*D4Science*	*0.2*
28.06.2021	*Description of Exploitation status and training*	*D4Science*	*0.3*

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Introduction

The Territori Aperti Gateway[1], provides users with access to the Territori Aperti Catalogue and to the Exploratories supporting scientific research with the creation of new knowledge and skills through the management and enhancement of data and analytical processes.

This document illustrates the services exploited by the Territori Aperti Gateway and reports the status of the activities at the end of the first 10 months.

Services

The Territori Aperti Gateway is equipped with the following generic facilities:

- A **gateway service** to provide users with a web portal to access the VREs.
- A shared **workspace service** enables every user to store and organise the information objects he/she is interested in working with. In addition to that, the user is allowed to collaborate with other users by sharing objects and messages. Each user is guaranteed up to 100 GB storage volume;
- A **publishing platform** to support data harmonization and publication. It resembles a catalogue of artefacts with search and browse, yet the openness with respect to the typologies of products published, the metadata to document them as well as the integration with the rest make it a flexible environment
- A **social networking collaboration platform** to enable users to use the common facilities typical of social networks – e.g., posting news, commenting on posted news – yet adapted to the settings of the working environments. Users can post news as well as applications. This platform embeds the following services:

    - A **messaging service** to provide users with a common email environment as-a-Service. The distinguishing feature is represented by its integration with the other services, e.g., it is possible to send any information object residing in the workspace (regardless of how "big" and "complex" it may be) as an attachment without consuming bandwidth;

[1] https://territoriaperti.d4science.org/

- A **notification service** to alert users on relevant activities as they happen. These notifications offer a sense of anticipation and create a productivity boost. Users receive an alert (through a priori selected channels, e.g., email, portal) notifying them when something of interest has happened in their VRE(s);

• A **VRE Management service** to enable authorized users (i.e. VRE Managers) to manage other users using or wanting to access the VRE. VRE Managers can (i) authorize users for access to the VRE, (ii) assign or withdraw roles to users, (iii) remove users, and (iv) send communications to the current users.

Additionally, with respect to Report No. 1 delivered at M4, some of the new activities performed in the new period, up to M10, aimed at:

1. the adoption of state of the art industry standards for authentication and authorization. In particular, **a new Identity and Authorization Manager (IAM) service** has been adopted to enhance the TerritoriAperti Gateway service. As shown in Figure 1, the implementation now fully adopts OIDC (OpenID Connect) for authentication and UMA (User-Managed Authorization) for authorization flows.

   Both protocols are specializations of the generic OAuth 2.0 specification. In order to be authenticated the TerritoriAperti Gateway implements the authorization code grant flow defined by OAuth 2.0. This allows for not having to share any credentials neither for users nor for the gateway service with software different from the IAM.

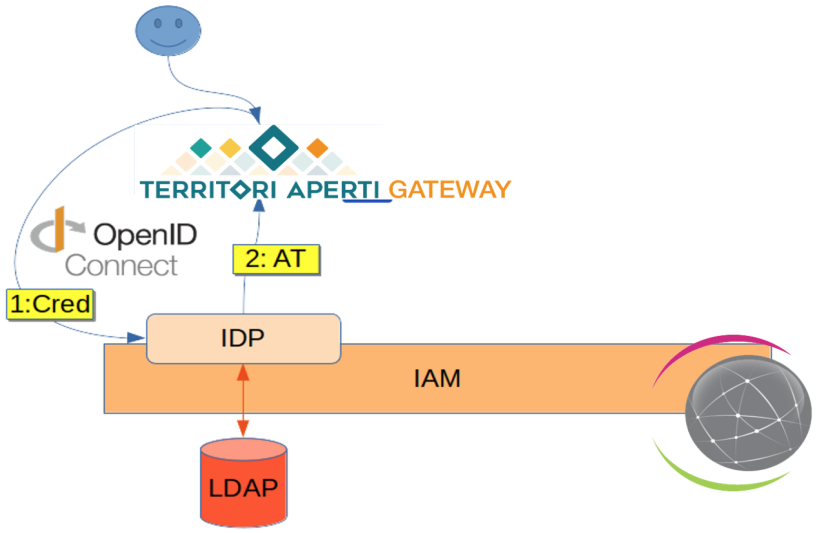

Figure 1: Logical view of the new login process with the new components involved

2. the adoption of Jupyter[2] Notebooks via a JupyterHub[3] cluster that is becoming the de-facto standard to provide an easy online coding system combined with interactive computing, in the TerritoriAperti VREs. The JupyterHub deployment over the Kubernetes cluster has been selected in order to offer a notebook solution with seamless access from the TerritoriAperti VREs graphical environment. Further integration steps have been performed in order to implement access to the above-mentioned shared **workspace service**. The access is implemented via the FUSE[4] library, which allows mounting the user workspace folders in the notebook environment.

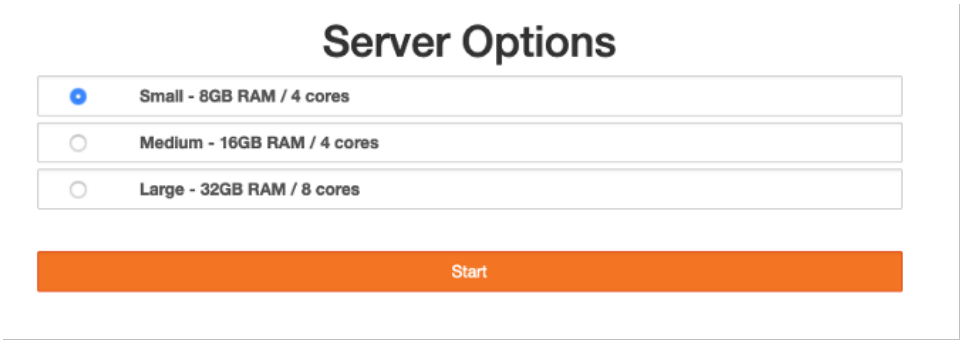

Figure 2: JupyterHub Notebook Server Options

[2] https://jupyter.org/
[3] https://jupyter.org/hub
[4] Filesystem in Userspace - https://en.wikipedia.org › wiki › Filesystem_in_Userspace

The Gateway exploits resources maintained and operated by the D4Science[5] Infrastructure [3].

Upon registration to the **Gateway Service**, the user can immediately use the storage space via the **Workspace Service**, the **Social Networking Collaborative Platform** including the ***Email Service*** to send/receive data to other registered users, the ***Social Service*** to share and read news and posts with your connections and the ***Notification Service*** for user notifications, and the **Catalogue Service** to browse available datasets, methods, and services therein published. They can also apply to one or more moderated or public **Virtual Research Environments** offering one or more additional services.

All the services made accessible through this Gateway are also accessible through APIs by specifying the secure token generated with the registration and specialised for each Virtual Research Environment the user is a member of.

Exploitation Status

The Territori Aperti gateway provides access to 6 different environments:

- 1 Catalogue,
- 2 Exploratories (Disaster and Pandemic Recovery),
- 1 Application (CO-GUARD),
- 1 Virtual Laboratory (TerritoriAperti Lab) and finally
- 1 Virtual Laboratory specifically configured for the management and exploitation of the Hack@EO L'Aquila 2021[6], an Hackathon (HackAtEO-AQ21) organised by University of L'Aquila.

[5] https://www.d4science.org

[6] https://territoriaperti.univaq.it/hackeo-laquila-2021-city-sustainability-indices-for-citizens/

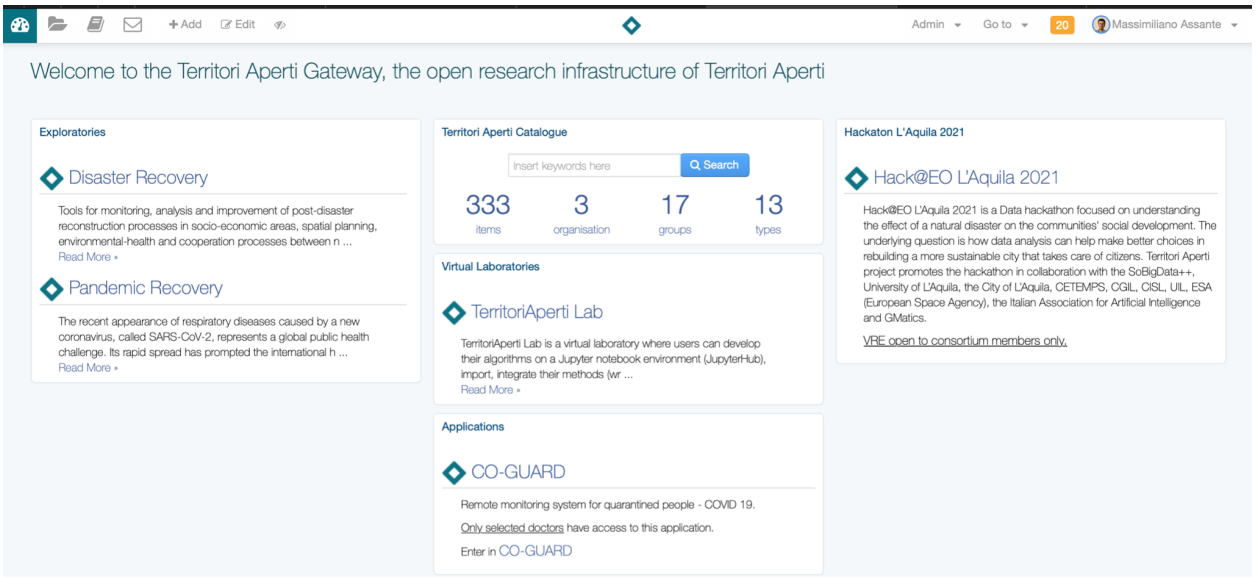

Figure 3: The 6 environments available in the TerritoriAperti Gateway

The following indicators document the exploitation of those VREs in the second reporting period, 6 months from December 2020 to May 2021. The indicators are extracted from the Accounting Dashboard [1].

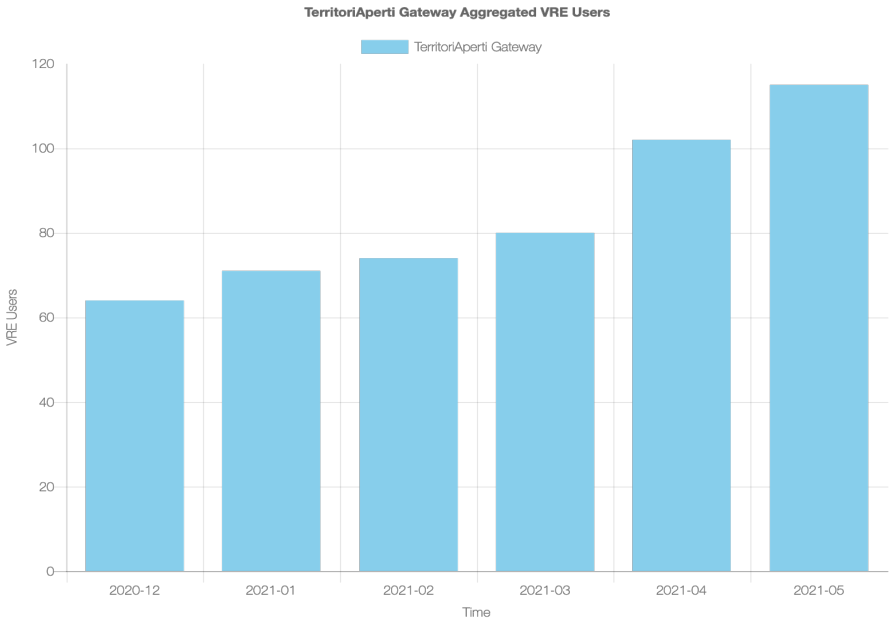

Figure 4: The TerritoriAperti Gateway environments (VRE) users from Dec. 2020 to May 2021

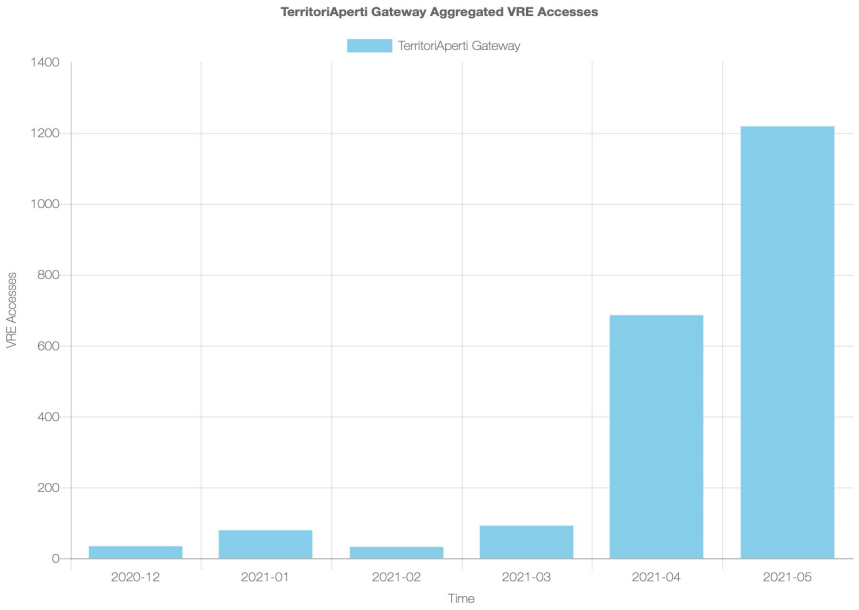

Figure 5: The TerritoriAperti Gateway user accesses to the environments (VRE) from Dec. 2020 to May 2021

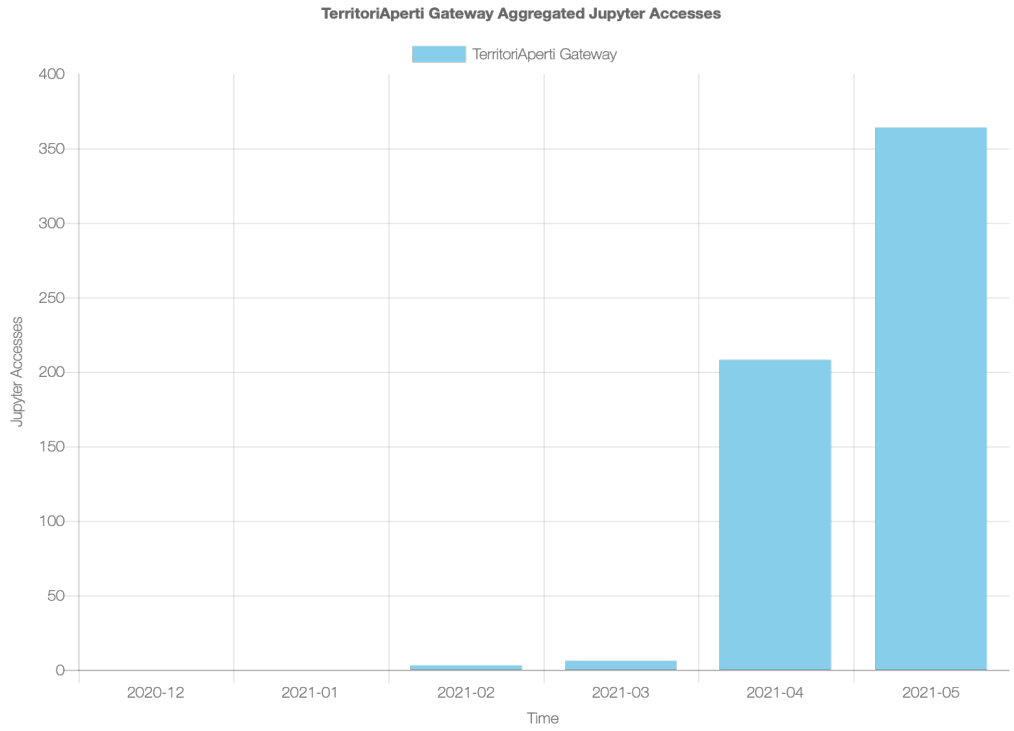

Figure 6: The TerritoriAperti Gateway accesses to the JupyterHub service from Dec. '20 to May '21

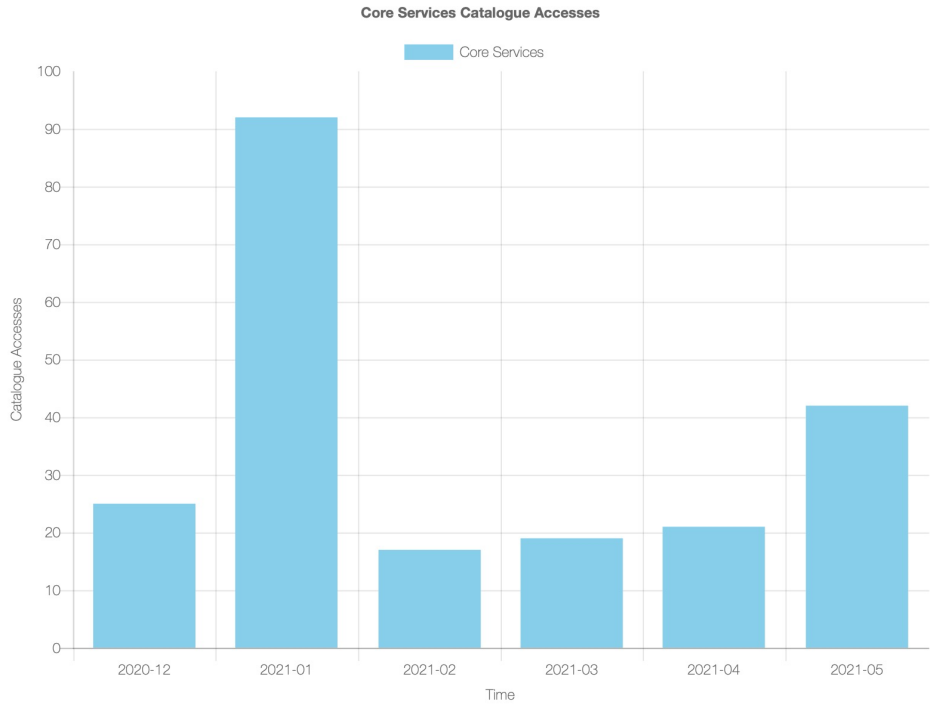

Figure 7: The TerritoriAperti Gateway accesses to the Catalogue from Dec. '20 to May '21

Training Report

No training events took place during the period. The training expected during the period was meant to be carried out through a webinar explaining how to integrate new methods, on the newly created Virtual Laboratory (TerritoriAperti Lab) into the platform. From a technological point of view, everything is ready and in place for the training to happen. In agreement with the Territori Aperti team, it was agreed to move the date after September 24th 2021 to ensure massive participation of attendees and fully exploitation of the Virtual Laboratory.

References

1. Accounting Dashboard (restricted access) https://territoriaperti.d4science.org/group/d4research/dashboard
2. Accounting raw data inspector (restricted access) https://territoriaperti.d4science.org/group/d4research/manager
3. M. Assante et al. (2019) Enacting open science by D4Science. Future Gener. Comput. Syst. 101: 555-563 10.1016/j.future.2019.05.063