

# EGI Virtual Team: Technology study for CTA

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Version 1.0

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## *Acronyms*

A&A	Astronomy & Astrophysics
CNRS	Centre National de la Recherche Scientifique
CRM	Customer Relations Management (EGI)
CTA	Cherenkov Telescope Array
DCI	Distributed Computing Infrastructure
EGI	European Grid Infrastructure
EGI-InSPIRE	EGI-Integrated Sustainable Pan-European Infrastructure for Researchers in Europe
ESFRI	European Strategy Forum for Research Infrastructures
ICC	Institute of Cosmos Sciences
IGI	Italian Grid Infrastructure
INAF	Istituto Nazionale di Astrofisica
IN2P3	Institut National de Physique Nucléaire et de Physique des Particules
LAPP	Laboratoire d'Annecy-le-vieux de Physique des Particules
NGI	National Grid Infrastructure
NIL	NGI International Liaison
NREN	National Research and Education Network
SCI-BUS	SCientific gateway Based User Support
SSO	Single Sign On
TERENA	Trans-European Research and Education Networking Association
VO	Virtual Organization
VT	Virtual Team

# 1 EGI Virtual Teams

The skills needed for EGI<sup>1</sup> to successfully engage as a community with new users exist in many different organizations within EGI-InSPIRE<sup>2</sup> and in the broader EGI ecosystem. It is foreseen that different members of EGI want to participate in different types of targeted activities that directly or indirectly relate to engagement with new users. The individuals needed to carry out such a targeted activity can be brought together by a Virtual Team<sup>3</sup> (VT) in EGI. VTs provide a flexible and dynamic means to rapidly bring together certain members of the community for a well-defined series of tasks to meet a specific goal that needs to be achieved in a relatively short period of time (on the order of weeks or months) before being disbanded. The focus of these VTs will be to either directly increase the number of EGI users (e.g. through integrating a new application) or indirectly (e.g. by raising the profile of EGI and a NGI through a NGI hosted event for its users). VTs have members from multiple NGIs and carry out a targeted action within the following activity domains:

- a) Marketing & Communication;
- b) Strategic Planning and Policy Support;
- c) Community outreach and events for new users;
- d) Technical outreach and support to new communities.

VTs can be established and used to enable the development of a strategy for the long-term evolution of EGI, or to significantly increase both the diversity and quantity of users and communities exploiting the infrastructure for world class research. The application of the framework is limited only by the scope and imagination of the NGIs to commit resources to any particular goal. EGI-InSPIRE NA2 members can and should use their NA2 project effort through VTs in order to efficiently contribute to the coordinated, pan-European activities carried out by EGI in engaging with new users.

## 2 A VT for CTA

### 2.1 Objectives

The Cherenkov Telescope Array (CTA<sup>4</sup>) is one of the ESFRI projects of the Astronomy & Astrophysics community. The CTA project is an initiative to build the next generation ground-based very high energy  $\gamma$ -ray instrument. It will serve as an open observatory to a wide astrophysics community and will provide a deep insight into the non-thermal high-energy universe.

The CTA will be extremely challenging for what concerns computing and data storage resources; for this reason the use of Distributed Computing Infrastructures (DCIs) is one of the possible options that could be taken into consideration in defining and implementing the computing model of CTA. It is worth noting however that the CTA project has not taken a final decision up to now about which computing model to use. Activities in this area are currently in progress within the preparatory phase of CTA and within its partner DCIs. However the EGI grid infrastructure is already exploited by the CTA project for the production and analysis of Monte Carlo simulated data within a dedicated CTA VO. This VO is supported by about 20 computing centers in Europe. The proposed EGI VT project aims to explore and investigate potential solutions to the computing and data access issues within the computing models under investigation for the CTA observatory. In particular two technical areas will be investigated: science gateway portals and federated SSO access protocols. It is worth to underline that VT project itself and its outcome will not imply any obligation for the CTA consortium.

For sure, CTA remains the key project for high-energy astrophysics in the forthcoming years with a natural aggregation capability for an entire branch of the astrophysical research; the adoption of DCIs to process data acquired through the CTA arrays could therefore be a significant step forward for the wide adoption of DCIs by the entire A&A community. In summary, the overall aim of the proposed VT project is:

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<sup>1</sup> EGI: <https://www.egi.eu/>

<sup>2</sup> EGI-InSPIRE: <http://www.egi.eu/about/egi-inspire/>

<sup>3</sup> EGI Virtual Teams: [https://wiki.egi.eu/wiki/Virtual\\_team](https://wiki.egi.eu/wiki/Virtual_team)

<sup>4</sup> CTA: <https://www.cta-observatory.org/>

“To investigate, identify and assess portal and SSO access models that may contribute to the CTA computing solutions in order to provide factually based recommendations for the way forward.”

Results of this project will be shared with the principal stakeholder(s) (the CTA project).

## 2.2 Topics

The EGI Virtual Team “Technology study for CTA” will focus on the following topics:

N	Topic	Estimated Length
1	Establish a social network between CTA and EGI through the support teams of the National Grid Infrastructures.	0.5 months
2	Use the social network to gather CTA user requirements concerning: a) Web based scientific gateways operated for the CTA community, making DCI resources and services from the NGIs accessible for CTA members; b) A Single Sign On (SSO) authentication, internationally federated, mechanism that would make web-based scientific gateways accessible for the CTA community.	2.5 months
3	Mapping the identified CTA requirements to solutions that exist within the EGI community and within its partners, such as the NRENs.	2 months
4	Document the findings and define a roadmap for implementing, deploying and operating an SSO solution and one or more scientific gateways for the CTA community.	1 month

Besides the non-technical work (topics 1 and 4) the VT focuses on two technical areas – SSO and web based scientific gateways and portals (topics 2 and 3). These two topics are key contributors to lower the barrier of DCI access:

- Web-based Science Gateways are community-specific set of tools, applications, and data collections that are integrated together via a web portal, providing access to resources and services from a distributed computing infrastructure. These gateways can support a variety of capabilities including workflows handling, virtualization of software and hardware, visualization as well as resource discovery, job execution services, access to data collections, applications and tools for data analysis. A science gateway enables community members to define and perform custom research scenarios or other types of use cases.
- Single Sign On solutions simplify access control to multiple related, but independent software systems. Through SSO a user logs in once and gains access to all systems he/she needs to carry out activities without being prompted to log in again at each of them. SSO solutions can be relevant for the human and automated workflows of CTA that need to use software, data and resources from multiple systems.

The EGI community has experience and knowledge in both of these areas and this can be leveraged for CTA through this VT:

- Several NGIs, and EGI partner projects (e.g. SCI-BUS<sup>5</sup>) develop and operate web based science gateways for scientific communities. These gateways and their enabling technologies are listed on a dedicated section of the EGI Website<sup>6</sup> and could be leveraged for CTA gateways.
- A currently running EGI VT will produce a “Science Gateway Primer”<sup>7</sup>, a comprehensive document that collects information about technologies, policies, solutions that exist from the EGI community

<sup>5</sup> SCI-BUS: <http://www.sci-bus.eu/>

<sup>6</sup> EGI Scientific Gateways: <http://go.egi.eu/sciencegateways>

<sup>7</sup> EGI Science Gateway Primer VT: [https://wiki.egi.eu/wiki/VT\\_Science\\_Gateway\\_Primer](https://wiki.egi.eu/wiki/VT_Science_Gateway_Primer)

for gateway developers. These documented technologies, policies and solutions can be leveraged for CTA gateways.

- EGI works in partnership with the National Research and Education Network (NREN)<sup>8</sup>. Many of the NREN members operate national identity federations and these federations could be leveraged for an SSO for CTA.
- EGI works in partnership with TERENA<sup>9</sup> which participates in the GÉANT Service, eduGAIN<sup>10</sup>, a service that connects NREN national federations into an inter-federation and which could be leveraged for the setup of an SSO for CTA.
- The Czech NGI operates a Single Sign On system on behalf of EGI.eu for the whole EGI community. This system and the experience of the Czech NGI in setting up similar systems could be leveraged for an SSO for CTA.

## 2.3 Tasks and expected Outcomes

	<b>Outcome</b>	<b>Means of delivery</b>	<b>Time of delivery (after VT start)</b>
Task 1	Social network between CTA members and EGI members (from EGI.eu and the NGIs)	<ul style="list-style-type: none"> <li>• The list of CTA – EGI connections are listed on the VT project Wiki page.</li> <li>• Information about CTA members is recorded in the EGI CRM<sup>11</sup> system.</li> </ul>	0.5 months
Task 2	Documented CTA requirements concerning scientific gateways and an SSO system.	<ul style="list-style-type: none"> <li>• Document (approved by the CTA consortium) that is publicly accessible in the EGI Document Database<sup>12</sup>.</li> </ul>	3 months
Task 3	Most suitable solutions from EGI and its partners that are capable to address the CTA requirements. Identified gaps in the EGI science gateways and SSO offerings to address CTA requirements.	<ul style="list-style-type: none"> <li>• Document (approved by the CTA consortium) that is publicly accessible in the EGI Document Database.</li> </ul>	5 months
Task 4	Final report that proposes a roadmap for CTA and EGI to setup scientific gateways and an SSO solution for the CTA community.	<ul style="list-style-type: none"> <li>• Document (approved by the CTA consortium) that is publicly accessible in the EGI Document Database.</li> </ul>	6 months

The outcomes will be delivered prior to the CTA consortium Data Management coordinator (Giovanni Lamanna) and their publication will require his approval. If the technological solutions proposed in the outcome documents meet the needs and requirements of the CTA project they will be used to achieve the scientific and technological objectives of CTA.

It is expected that these outcomes will be general enough to be re-used or taken in consideration in other astroparticle and astrophysics observatory related projects.

<sup>8</sup> NREN: [http://en.wikipedia.org/wiki/National\\_research\\_and\\_education\\_network](http://en.wikipedia.org/wiki/National_research_and_education_network)

<sup>9</sup> TERENA: <http://www.terena.org/>

<sup>10</sup> eduGAIN: [www.edugain.org/](http://www.edugain.org/)

<sup>11</sup> EGI CRM: <https://wiki.egi.eu/wiki/CRM>

<sup>12</sup> EGI Document Database: <http://documents.egi.eu>

## 2.4 Members

The CTA VT is intended to be created by involving EGI.eu, all interested NGIs and the CTA Consortium itself.

Administrative support for the VT project will be provided by Richard McLennan (User Community Support Officer at EGI.eu). Gergely Sipos (Technical Outreach Manager at EGI.eu) will be responsible for the delivery of technical activities from the EGI side. Particularly, he – together with the NILs (NGI International Liaisons) – will: (1) ensure contact with the National Grid Infrastructures, so these NGIs can contribute to and can get informed about the progress of the Virtual Team project and (2) will participate in Task 3 (mapping of identified CTA requirements to solutions that exist within the EGI community and within its partners, such as the NRENS).

The NGIs that already expressed interest in participating in the CTA VT are listed below:

- IGI, Italy
- France Grilles, France
- PL-Grid, Poland
- ES-NGI, Spain

The list of Institutions of the CTA Consortium taking part in activities of the CTA VT is listed below with the reference persons for each Institute enclosed in parentheses:

- CNRS/IN2P3/LAPP, Annecy, France (Giovanni Lamanna, Nadine Neyroud, Cecile Barbier, Nukri Komin)
- University of Barcelona/ICC, Barcelona, Spain (Ricardo Graciani)
- INAF, Italy (Claudio Vuerli, Ugo Becciani, Alessandro Costa, Fabio Vitello)

Claudio Vuerli will be the CTA VT project manager and is thus overall in charge. He will report directly to Giovanni Lamanna about the VT activities and related progresses on a monthly time scale. Because the listed institutes are also part of the CTA consortium and of their respective NGIs, they are in the position of ensuring a good level of collaboration within the VT, fostering the flow of information and the production of fully satisfactory deliverables both for CTA and for EGI/NGIs.

## 2.5 Duration and organization

The VT is expected to run for 6 (six) months.

The four tasks of the VT will run sequentially. The VT project manager is in charge of the monitoring of activities carried out by each task to ensure that they deliver the expected output on time. The VT project manager is in charge of the VT's face to face meetings and audio/video conferences. He will also keep the VT wiki page up to date with all relevant information about the VT tasks, members, schedule, progress and outputs. Weekly progress reports are to be sent to the EGI NA2 management list<sup>13</sup> ([inspire-na2-leaders@mailman.egi.eu](mailto:inspire-na2-leaders@mailman.egi.eu)).

The coordinator is also in charge of the dissemination of the results achieved through the VT especially in the context of the CTA and EGI meetings. The dissemination could happen after validation and approval of Giovanni Lamanna, CTA Data Management coordinator.

Task leaders will be assigned in week one of the project. The task leaders are in charge of the correct accomplishment of the activity planned for their task. They organize the task activities and pass all relevant information concerning the task to the VT project manager.

Giovanni Lamanna, on behalf of the CTA consortium, endorses the VT coordinator activity while keep responsibility and authority to re-address the VT-project activities and the VT members' actions if they will result not compatible with the CTA project rules and expectations.

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<sup>13</sup> This is the standard monitoring process in EGI for VTs.