
EU-T0

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New major projects currently under design and/or construction, particularly in astroparticle physics, have already become new challenging platforms of further developments, e.g. CTA, SKA, EUCLID, LSST, VIRGO-LIGO and other GW projects.

In fact they have a data throughput of the same order of magnitude if not even larger than LHC, with severe data management issues.

These projects encompass an even larger research community bringing together high energy physics and astrophysics agencies to potentially cooperate together and share some new e-Science challenges.



The discussions about “Astroparticle and Computing” took place in the last three years in three dedicated workshops organized in the context of ASPERA/APPEC :

Lyon 2010:

<https://indico.in2p3.fr/conferenceDisplay.py?confId=3845>

Barcelona 2011:

<https://indico.cern.ch/conferenceDisplay.py?ovw=True&confId=134280>

Hannover 2012:

<http://indico.cern.ch/conferenceDisplay.py?confId=159120>

They demonstrate a high level of complexity of this topic and the need for further coordination.

A White Paper for Computing and Astroparticle Physics will be released...

ISSUES UNDER DEVELOPMENT AND INVESTIGATION IN AP PROJETS:

- Big Data management: e.g. towards new DB technologies, distributed and federated archives, data mining, ...
- New computing models: e.g. distributed cloud infrastructures, new private-public paradigms, sustainable e-infrastructures, world-wide shared data pipelines, ...
- New software and middleware: e.g. parallel programming and MC simulations, new computing and storage technologies, ...
- Data management: e.g. open data access, scientific frameworks and user services, certification protocols, ..

CONSEQUENCES :

Potential shared developments and common deliverables/services.

DIRECTIONS :

- Creation an e-infrastructure “Centre of excellence”
- Participation to “e-infrastructure” initiatives
- Promote World-wide cooperation on computing
- Training network





WLCG

Worldwide LHC Computing Grid

The know-how of high energy physics community (e.g. LCG) with their own national computing centres in data archive, data management and scientific user support has had interdisciplinary benefits in nearby fields. This has allowed the high energy physics community to extend connections and cooperation to other agencies/communities: e.g. astrophysics, space physics, medical physics, neuroscience, pharmaceutical and other life sciences researches.

The interdisciplinary cooperation needs to be encouraged both at the level of research communities as well as at inter-agencies level, the latter being critical for the first. In this context the May/July 2013 publications (CERN-OPEN-2013-017/018/019) prepared by CERN on behalf of EIROforum IT Working Group have emphasized this issue and obviously inspired our initiative: innovative developments in data management are also in progress or in high demand in other scientific contexts and intergovernmental research organisations can commit to a shared policy.

A new paradigm of DCI and e-infrastructures is also proposed.

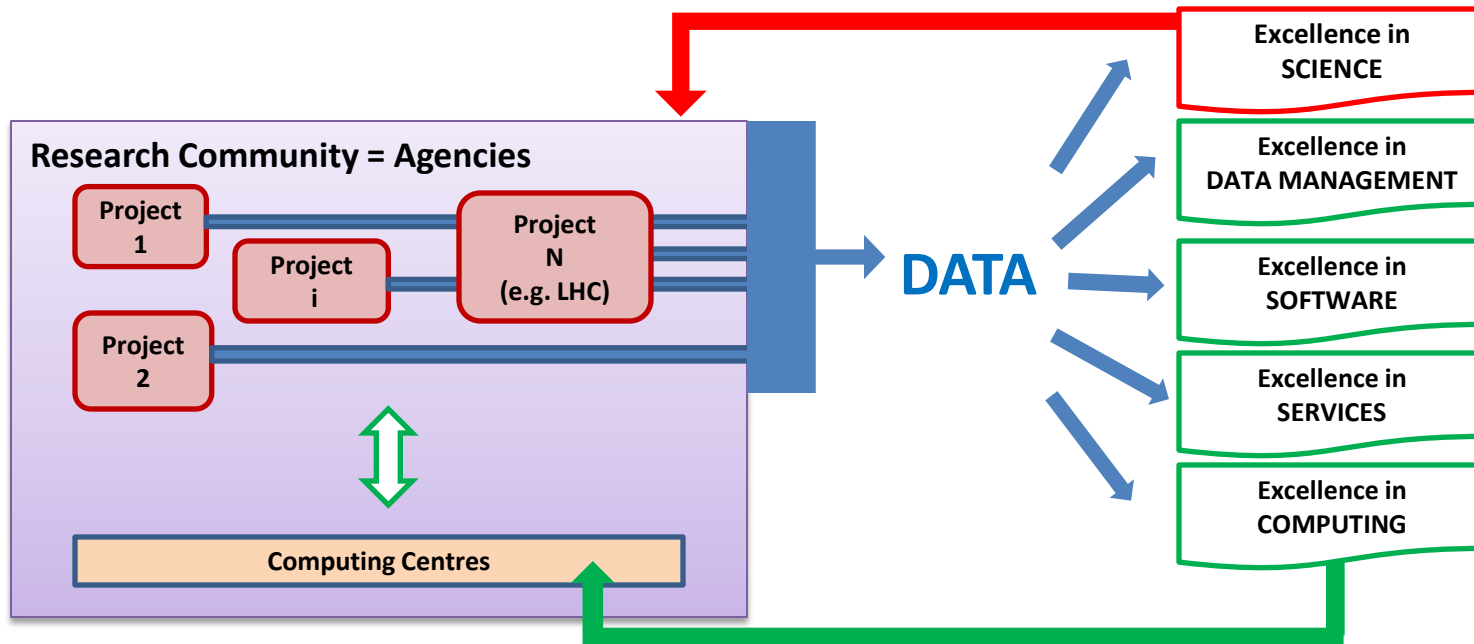
EU-T0: Integrated Distributed Data Management Infrastructures for Science and Technology

The initial scope of EU-T0 is the support of research projects in the fields of Particle, Nuclear, Astro-Particle Physics, Cosmology and Astrophysics. This notwithstanding, opportunities will be explored to provide support to projects in other fields of science of technology.

*The model aims for a DCI paradigm more “efficient” and “sustainable” and based on macro research communities, e.g. ELIXIR, CLARIN, LifeWatch already along this path; **EU-T0** follows.*

EU-T0: a researchers & data centric view

- Our (current and future) projects are DATA INTENSIVE.
- We are the research community demanding the SERVICES for these projects (often very similar).
- We operate the COMPUTING CENTRES to support those services and manages the intense scientific data.
- We are always (, all together or often a good fraction of us) partners in these RESEARCH PROJECTS.



Inspiring and feeding the federated CCs as a Tier-0 Center of Excellence

EU-T0 areas of interests :

- operation of common cloud services and protocols;
- future evolution of current grid/cloud and big data e-infrastructures;
- mutual exchange and agreement on shared core services for cooperative operations;
- dedicated network developments to connect centres each other at pan-European level;
- global “virtual research environments” built on shared archival and data access services, together with tools and applications tailored to diverse community needs and targeted for major future experiments;
- preparation of “data scientists” aimed to lead the major changes in e-Science;
- interfaces with large HPC infrastructures and with the private sector aiming to be a “pilot” public/private cloud system;
- incubation of forefront software developments required by the majority of new research projects: e.g. parallel programming, non-relational databases, virtualization, new big-data scientific frameworks, scientific gateways and scientific analysis systems;
- issues, policies and services for data preservation. This will encompass both the technology for long term data archival and open data access, and the mutual promotion of protocols among different scientific communities concerned towards a unique and sustainable methodology.

EU-T0: a global and coherent initiative

Federating institutes and Universities to promote “data scientists”:

- *PhD programs (mixing Physics and Computing science)*
- *“Use cases” for computing research*
- *Public + Private corporate for every specific research project*
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**EU-T0
TRAINING CENTRE**

Federated unique “stakeholder” in the “e-infrastructures” landscape:

- *Sustainable data interoperability, data sharing, data preservation: RDA*
- *Assuring coherence with “long-tail science” e-infra. providers: EGI*
- *Developing a global HTC+HPC model: PRACE*
- *Practical big-data experience feedback : EUDAT*
- *Driving inter-CC networking investments: GEANT*
- *Deployment of identity inter-federation: EDUGAIN*
- ...

**EU-T0
E-INFRA_s STAKEHOLDER**

Federating private and public partners for “pilot” projects:

- *Supplying data warehouse (private+public) for HPC output data*
- *Cloud paradigm*
- *Pilot model core services for private applied research*
- *Investigating Green solutions (per project).*
- *Accessing “private competences” for research purposes.*
- ...

**EU-T0
P.+P. PILOT MODEL**

EU-T0: Position Statement

A position statement document has been approved by Signatories during a dedicated inter-agency meeting held at CERN on the 11th February 2014.

The Signatories mandate the authors to bring about the following steps:

- Approach other European funding agencies to expand the collaboration.
- Agreement on the official roadmap for establishing the “EU-T0”, the terms of the agreement among parties and the kick-off of the federation.
- Definition of a detailed work program around a series of simultaneous projects which will be submitted to a series of H2020 calls.

European agencies position statement: towards the “EU-T0” federation.

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EU-T0 is a genuine initiative to federate the Institutes , the Computing Centres and the large research community involved in Particle, Nuclear, Astro-Particle Physics, Cosmology and Astrophysics

EU-T0 is a “Data Research and Innovation Hub”: a virtual European Tier0 computing center around which all other national centers revolve and from which all concerned national e-infrastructures radiate.

EU-T0 is our domain-based e-infrastructure to support our (large) community.

The EU-T0 concerned community will speak with one single voice to promote its activities outside. The cooperation with non-European counterparts will be encouraged but also with similar “hubs” in other domains, e.g. ELIXIR, CLARIN, LifeWatch, to ensure their global interoperability.

EU-T0 is a collaboration among “institutes”, organising “researchers”, promoting the know-how and the e-infrastructures that we “own”.