



e-Infrastructure Board

Stefano Bagnasco, INFN

for the ET-EIB

ET Monthly Meeting | Jun 7, 2022

«...to design, create and operate an evolving, efficient and functional e-infrastructure environment at a reasonable cost for the collaboration. Initially the focus will be the development of a Computing Model for the ET».

- Prepare a plan of the studies and activities that need to be undertaken for the development of the ET computing.
- Propose a computing model and its updates to the collaboration.

Out of scope: actual science code, physics and engineering tools

Data transfer and storage: safely and efficiently transfer all data to custodial storage and processing centres, including low-latency transfers;

Software packaging and distribution: manage software lifecycle, and make packages available ubiquitously;

Computing power: provide and manage computing resources (HTC and HPC) for the processing of data, in all computing domains;

Data distribution: make data available to worker nodes in computing centres anywhere, and possibly also to single workstations, including support to public releases of data;

High-availability service management: provide a platform for running the collaboration's services (e.g. alert generation services, event databases,...)

Data cataloguing and bookkeeping: organise all data and metadata and provide querying and discovering capabilities;

Job lifecycle management: provide a uniform job submission and runtime environment to research groups;

High-level workload management: keep a database of all jobs and allow the enforcement of priorities and scheduling strategies; provide support for organized large-scale data processing campaigns;

Monitoring and accounting: monitor local and distributed computing, checking performance and looking for issues, and provide reliable accounting both at the user/job and site level;

Authentication, Authorisation and Identity management: provide consistent AAI across all domains and activities.

Collaboration services: provide tools for efficient collaboration management, coordination, and outreach (e.g. document repositories, collaborative tools, administrative databases, communications,...)

Computing support: provide a support infrastructure for all computing activities

Division 1: Software, frameworks, and data challenge support

Division 2: Services and Collaboration Support

Division 3: Computing and data model, Resource Estimation

Division 4: Multimessenger alerts infrastructure

TTG: Technology Tracking working Group

Division 1: Software, frameworks, and data challenge support

Scope: Define the software frameworks for ET computing workflows, the middleware for infrastructure, workload and data management. Develop software quality best practices and support their adoption with training and enforcement policies. Support code development in all computing domains. Provide computing support for mock-data challenges.

- Still missing a chair!
 - EIB Chairs as interim
- Main current activity: gathering information about needs for upcoming data challenges
 - 2 meeting to date, many things still to be defined
 - **General plan:** provide a minimal data distribution infrastructure for the first MDC and survey actual use cases and workflows. Use following MDCs to iteratively provide more complete infrastructure prototypes.
 - See also Sara's presentation later

Division 2: Services and Collaboration Support

Scope: IT services needed for the administrative management of the Collaboration, communication and collaboration within the Collaboration and outside.

Chair: **Antonella Bozzi, EGO**

- Following the work on the development of the ET Members Database (ETMD), modifying the app in order to meet the requirements, the Division has been busy in the population of the database:
 - processing and integration of information provided by the RU Leaders in the RU-submission Excel files;
 - rollout of the application to the RU Leaders, to add email addresses and other metadata to their RU member profiles, as well as providing the EGO IT Department with the information relating to their institutions (this is the current phase, ~50% complete);
 - once done, the ETMD will be rolled-out to all ET members.

Division 2: Services and Collaboration Support

Scope: IT services needed for the administrative management of the Collaboration, communication and collaboration within the Collaboration and outside.

Chair: **Antonella Bozzi, EGO**

- Note that the ETMD is already being used for the management of the Active Directory accounts for access to the ET web services.
- Following the ETMD roll-out, there is an additional modification to incorporate: allowing RU Leaders to insert/remove RU member FRTE contributions.

Division 3: Computing and data model, Resource Estimation

Scope: develop the Computing Model. Provide a running estimate of the computing resources needed for all computing domains.

- **Chair: Gonzalo Merino, PIC**
- The overall architecture of the e-Infrastructure, possibly as a few separate systems (e.g. instrument control and DAQ, low-latency, and offline)
- A documented way of evaluating the required computing power and storage space from the evolving scientific program of the collaboration
- Estimates of the involved costs and growth timelines
- A description of the data flows, with estimates for the needed network performances
- A description of the User Experience and workflows for relevant activities
- A description of the tools chosen or to be developed to provide all the required functionalities (foundation libraries, frameworks, middleware,...)
- Separate “Work Breakdown Structure” and “Implementation Plan” documents

Division 4: Multimessenger alerts infrastructure

Scope: Design and develop the infrastructure needed for multi-messenger triggers management and distribution. Follow the development of software tools for low-latency computing.

Chair: Steven Schramm, Université de Genève

- Division activities are getting started; interested participants are encouraged to get in touch!

Division 4: Multimessenger alerts infrastructure

Two upcoming events of interest to the community (hybrid events, remote participation is possible):

- **12th White Rabbit workshop**, Oct 8-9 at CERN:
 - <https://ohwr.org/project/white-rabbit/wikis/Oct2022Meeting>
 - White Rabbit is a project for Ethernet-based time-defined networking, such as for low-latency networking
 - Includes a talk on application to GW on Saturday Oct 8 at 17:00
- **Multi-messenger Astrophysics Workshop**, Oct 10-12 at EGO:
 - <https://indico.ego-gw.it/event/199/>
 - Second iteration, focused on services and software underlying multi-messenger alert systems
 - Will work towards a common proposal for the EU call HORIZON-INFRA-2023-SERV-01-02

TTG: Technology Tracking working Group

Scope: track the evolution of hardware, middleware and software technologies

Chair: Sara Vallero, INFN Torino

- The working group is a coordinated cross-division effort
 - We aim at involving (at least) one representative per division
- Activities:
 - Review and present to the EIB promising new technologies of possible benefit for the different divisions' activities
 - Work in synergy with the other EIB divisions to realise Proof of Concept solutions based on new technologies of interest

Scope: track the evolution of hardware, middleware and software technologies

Chair: Sara Vallero, INFN Torino

- The latter activity will leverage, among others, the ET R&D cluster that will be made available at INFN-Torino in the following months.
 - The cluster will be funded by the ETIC (Einstein Telescope Infrastructure Consortium) PNRR project.

EIB Chairs: Patrice Verdier (IN2P3), SB (INFN)

WP8 leaders: Achim Stahl (U. Aachen), Sergi Girona (BSC)
+ Nadia Tonello (BSC)

- Joint WP8+EIB weekly call for coordination
- BSC has hired a “system engineer”-like profile to follow the preparation of the computing model
- EIB is defining the division chairs (nearly there...) and populating the organigram
 - More about this later

- Computing is not as pressing as other activities
- But some things need to be done soon
 - Collaboration services
 - MDC support
 - Multimessenger infrastructure coordination
 - ...
- Still missing some personpower
 - Waiting for the ETMDB to be populated
 - ETIC in Italy will provide $o(1\text{FTE})$
- Skilled personpower for computing is always a challenge
 - All help welcome