

ELITRANS project and DIRAC

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ELI in a Nutshell

ELI: Extreme Light Infrastructure: 3 cutting edge European laser research institutions

ELI-ALPS (Szeged, Hungary):

- ultrashort (attosecond) pulses with high repetition rate, frequency range between THz and X-ray

ELI-BL (Dolní Břežany, Czech Republic):

- Ultra-high power (10 PW) and intensity up to 10^{24} W/cm² radiation sources and particle beams

ELI-NP (Măgurele, Romania):

- Combined laser and nuclear physics experiments with very high intensity laser system and very intense, brilliant γ -beam

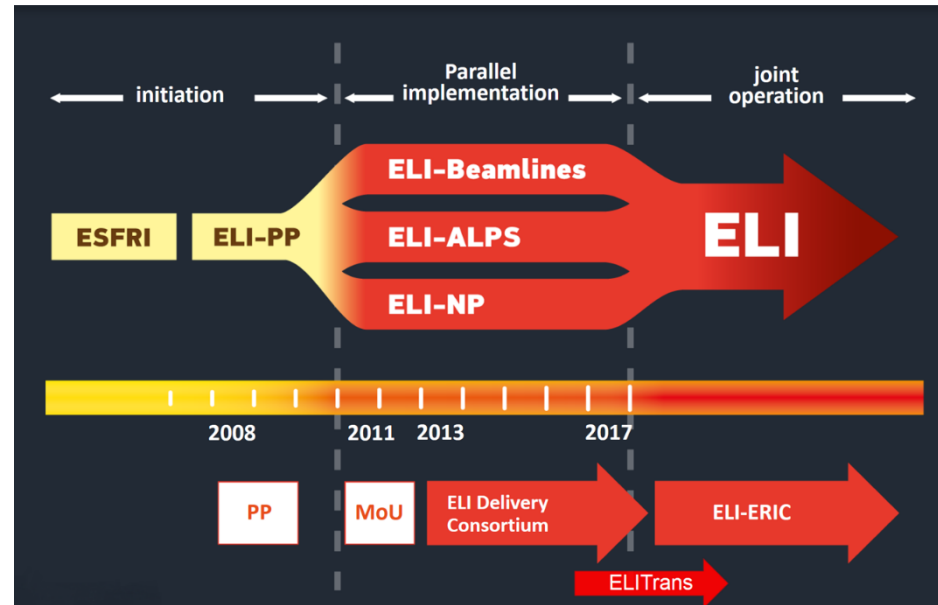


From Conception to Operation

All the three pillars are in implementation phase now

Construction and operation are maintained in different organisational frameworks:

- Pillars are developed independently
- When completed, pillars will be operated jointly
- Joint operation will be controlled by ELI-ERIC



ELITRANS: H2020 project to lay down the organisational, conceptual and legal groundwork for ELI-ERIC and facilitate the transition from development to operation

Main ELITRANS objectives

Developing concepts for ELI-ERIC's business model:

essential elements of the future ELI-ERIC's organisation, legal constitution, financial sustainability, governance, user relations, and international integration

Preparing ELI-ERIC's "business plan", adapted to the operation as the world's first international laser user facility

concepts for a VRME, definition and standardisation of user-facility interfaces, health and safety regulations, specialized experiment preparation techniques, computing and big-data management, innovation and technology transfer aspects

Facilitating the merger of formally independent construction projects towards one unified pan-European RI

Steps towards the transformation and unification of ELI's internal structures and organisational procedures, the creation of an internal corporate identity, harmonisation of international relations, creation of a common scientific profile and competitive user research opportunities.

ELITRANS Facts and Figures

Key objectives:

- Developing concepts for ELI-ERIC's business model
- Preparing ELI-ERIC's "business plan"
- Manage the merger of independent developments into one unified RI

Timescale, budget:

- September 2015 – August 2018 (36 months)
- 11 work-packages, a separate one is devoted to „Data and computing“
- EC funding of 3.4 m EUR

Consortium members:

- Coordinator: Extreme Light Delivery Consortium ASBL
- Pillars: ELI-ALPS, ELI-BL, ELI-NP
- E-infrastructures specialised at research data handling: PRACE, KIT (EUDAT), EGI
- Strategic partners: DESY, STFC, Elettra

Data and Computing Challenges

Technical

- When fully operational, the 3 pillars will provide services to thousands of users per year, generating 5-10 petabytes of data at 30 beamlines combined
- Some beamlines will operate high repetition light sources (-> in theory, extremely high amount of data can be generated, thus balance must be found between expectations and feasible solutions).
- Researches will cover many areas from nuclear physics to life sciences

Organisational, legal

- IT governance at ERIC and pillar level has not fully defined yet (financing model, budgeting, procurement rules and control of resources is still to be set up)
- Optimal arrangement of common and local resources must be found
- Meet the growing demand for openly available research data (given the amount of data, this is also a tech challenge)
- Match ELI business / operational rules with that of e-infrastructure

Task 10.3:

Define the common ELI-wide data management service layer

Create an overall strategy and implementation plan that address the identified requirements of the ELI-wide data management service layer.

This layer acts like **a bridge toward different e-Infrastructures, integrates their services** and fills in the gaps and helps to keep the flexibility and scalability of the ELI-wide data management solution. **Execute pilot projects** to reduce risks and to support the long term strategic decisions. Involvement of different e-Infrastructures, local data repository partners and user groups is essential in this task.

Data intensive tasks: estimates in tens of PB of produced data per pillar per year

Virtual Organizations

VO eli-beams.eu

- Started in 2014 to provide resources for simulations required for ELI-BL
- 7 active users
- Usage decreased since 2015, when a local cluster became available
- Users also use HPC resources in IT4I in Ostrava (CZ)
- User support via CESNET RT: egee@rt4.cesnet.cz
- Resource center prague_cesnet_lcg2 (CESNET)

VO eli-np.eu

- Started in 2015
- 15 active users
- Resource centre GRIDIFIN

Virtual Organizations

Countries — Total number of jobs by VO and Year (Custom VOs)

VO	2014	2015	2016	2017	Total	Percent
eli-beams.eu	164	0	2	0	166	0.05%
eli-np.eu	0	94,920	249,102	2,443	346,465	99.95%

Countries — CPU Efficiency (%) by VO and Year (Custom VOs)

VO	2014	2015	2016	2017	Total
eli-beams.eu	1736.86%	0%	0%	0%	1736.25%
eli-np.eu	0%	96.82%	93.23%	98.69%	94.49%

Goal: common VO with DIRAC instead of WMS for job submission

Open Issues

User Management

- Internal and external users
- Access rights to resources at each pillar
- X509 certificates cumbersome for many users
- Common VO management

Data Management

- Open Access
- Responsibility for deletion and archive
- Tools for data access and management

Open position

ELI-BL (Prague)

- Missing manpower for the task 10.3
- Position available immediately