

e-IRG Workshop
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e-Infrastructure Governance: legal and financial aspects

Questions

- How to finance investment in international e-Infrastructures, without creating barriers for international use
- How to remove artificial national (legal) barriers for international e-Infrastructure service provision
- How to balance national and European contributions to e-Infrastructure ecosystem

Overview of situation today

- There is no “one size fits all” approach
- Various existing approaches depending much on degree of distribution of e-Infrastructure
 - Establishments under national law in most cases
- Reaching beyond European borders can add significant complexity
 - Different approaches depending on region
- Special case: software infrastructures
- Catalytic role of EU procedures and funding

Example: GEANT

- European backbone network GÉANT
 - Highly distributed
 - DANTE established under UK law
 - National (NREN) contributions proportional to GDP
 - Open access to all member NRENs
- International links of GÉANT
 - Co-funding agreements of links to developed regions (e.g. 50-50% with the USA)
 - Increased EU contribution in case of developing regions (approach depends much on the region and the overall relations between the EU and the region)
- Catalytic role of EU procedures and funding



Example: EGI

- European Grid Infrastructure (EGI)
 - Highly distributed
 - EGI.eu established under the NL law
 - Nationally owned computing resources
 - National (NGI) contributions to European operations of EGI proportional to GDP
 - Open access to participating NGIs; allocation of resources driven much by needs of virtual research communities per scientific field
- International links of EGI
 - Peering with similar infrastructures in (developed mostly) regions (e.g. USA)
 - Allocation of resources driven much by practices/needs of virtual research communities per scientific field
 - Companion EU-funded projects link EU infrastructure/communities with infrastructures/communities around the world (L.America, SE Asia, China, India, Mediterranean etc)

Example: HPC (PRACE/DEISA)

- European HPC-infrastructure
 - Infrastructure highly concentrated in a few countries
 - Established under Belgian-law
 - Nationally funded and owned in principle supercomputing machines
 - Additional EU-level funding and in-kind contributions by other MS (notably for SW, operations)
 - Proportion of computing time for European level use
- International links of HPC-resources
 - Peering with similar infrastructures in (developed mostly) regions (e.g. TeraGrid in the USA - Joint global file system)



Special case: SW-infrastructure

- SW is a very significant part of all e-Infrastructures
- Important SW parts are generic across vastly distributed HW-infrastructure (e.g. grid-middleware) or across geographically distributed scientific communities (scientific gateways)
 - SW expertise is broadly distributed as well
 - Many entities/countries benefit directly by co-developments
- This makes the co-funding/openness of SW-based e-Infrastructures easier to achieve
- Examples:
 - EGEE/EGI-projects on European level
 - Possible co-funding on international level of development of SW for exascale HPC-systems (International Exascale Software Project)



Comparing with highly localised facilities

- Typical examples are the ESFRI-roadmap RI
- More difficult to reach establishment/co-funding and open access agreements than in e-Infrastructures
 - Important upfront costs
 - One country benefits usually most
 - Complex legal and other issues (lengthy establishment negotiations – e.g. *CERN*, *ITER*) variety of legal structures)
- ERIC regulation key instrument for international RI establishment agreements (co-funding, open access)
- Recent efforts to develop more distributed RI positive (*central facilitating role of e-Infrastructures*)
- EU procedures and funding playing a catalytic role (facilitating establishment, European level access through transnational access programmes etc)



Some conclusions, lessons learned

- International agreements easier when infrastructures are highly distributed
- Important European experiences on establishment/co-funding, open access to intern. e-Infrastructures
 - Need of continuous excellence (innovation & sustainability, openness to international excellent science, competition & benchmarking, user support & friendliness..)
- Users playing important role in fostering open access
- Collaboration agreements on SW-parts of RI can leverage co-funding & open access agreements
- Key role of e-Infrastructures in enabling access to highly localised facilities; also in facilitating creation of more distributed RI schemes
- Catalytic role of ERIC & EU procedures and funding

Thank you!

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