Role of e-Infrastructures in the EOSC Nodes Ecosystem.
View from the e-Infrastructures

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for the
eInfra Assembly

e-Infrastructures - for researchers

Delivery of **integrated** services

OpenAIRE Graph and interoperability framework for research data repositories

Transnational access to EGI Federation compute, storage, AI and federated access services for research data reuse with RIs

GÉANT's core AAI platform enables members of the R&E community to create and manage virtual teams and securely access and share common resources and data

Cross border data sharing, data referencing, data archiving, FAIR data with the EUDAT portfolio

User-centric PRACE support services for productive use of HPC+ technologies for Science and Innovation

Services for the EOSC federating Core
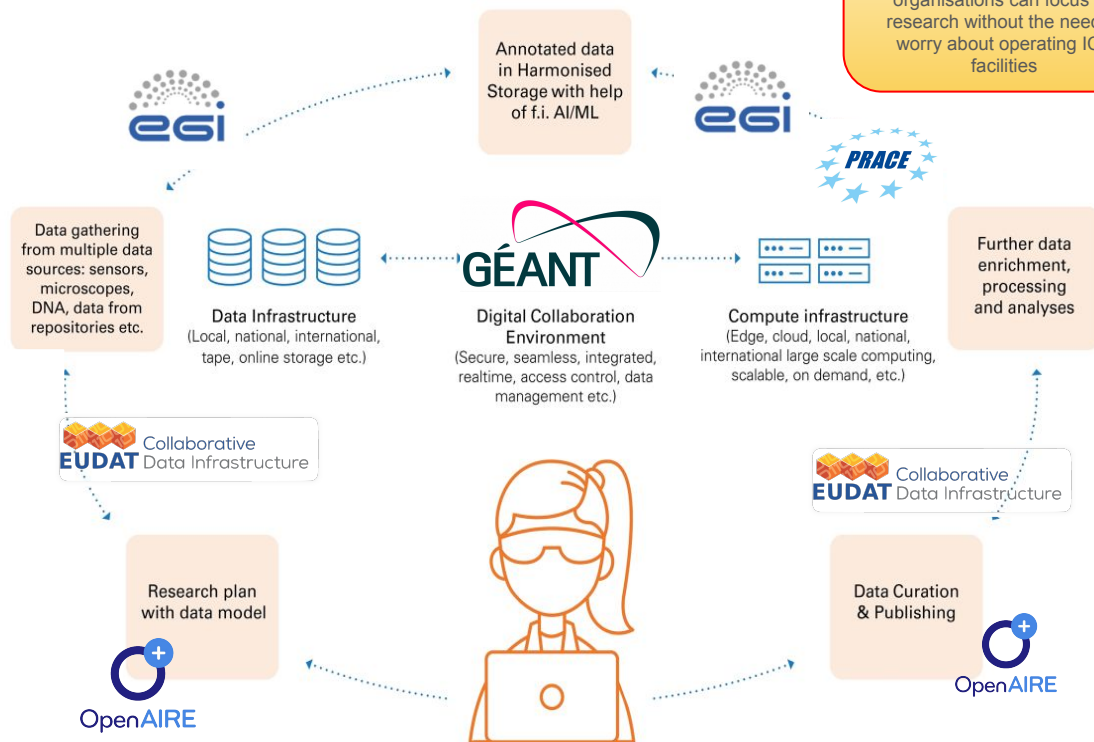
e-Infrastructures support EOSC nodes and foster innovation in open science.

Researchers and research organisations can focus on research without the need to worry about operating ICT facilities

Annotated data in Harmonised Storage with help of f.i. AI/ML

Data gathering from multiple data sources: sensors, microscopes, DNA, data from repositories etc.

Data Infrastructure
(Local, national, international, tape, online storage etc.)

Digital Collaboration Environment
(Secure, seamless, integrated, realtime, access control, data management etc.)

Compute infrastructure
(Edge, cloud, local, national, international large scale computing, scalable, on demand, etc.)

Further data enrichment, processing and analyses

EUDAT Collaborative Data Infrastructure

EUDAT Collaborative Data Infrastructure

Research plan with data model

Data Curation & Publishing

OpenAIRE

OpenAIRE

Image source: SURF/NL

e-Infrastructures - operational numbers (2023)

- IP networks
    - 7 PB data per day (30% increase/a), 8 Tb/s backbone, >120 national and education networks (NREN) connected
- Authentication
    - Eduroam (WWAN access)
        - 7,5 billion authentications in 2023, 104 countries, > 10k institutions, >38k service locations
    - eduGAIN (enabling single sign on for services): 79 countries, > 5k Institutions, >3k service locations
- Compute
    - Worldwide infrastructure, 23 ESFRI RIs supported, 50 int scientific collaborations, +2800 open access publications/year, 95K users, 7.0B CPU hours, +370M jobs/year
    - 947 scientific projects enabled with >32.5 billion HPC core hours awarded
- Data storage
    - 4.200 k files managed, 4 PB, >11 k data sets shared
- Scientific data sets, references (PID), library and searches (e.g research graph and b2find)
    - > 13.000k data sets registered, 250.000 k hits, 1.100.000 k downloads, 126 PB referenced data
    - 30.000k registered PIDs, 31 prefixes
- Communities, scientific domains, networks
    - Covering all sciences, many ERICs, expert networks for scholarly communication, courseware, (summer) schools, training bootcamps and workshops

Millions invested through (EU) grants, MS, national and institutional support

e-Infrastructures for EOSC

- e-Infras offer a broad range of compute, trust & identity, data and network services
  - federated computing, research data gathering, storage and management
  - Integrated services using common exchangeable formats
  - Used in the EOSC EU node
- e-Infras contribute to the implementation of the federation and the EOSC node(s)
  - Help shape the policy and implementation agenda
  - 20 years+ expertise: HTC, HPC, Cloud and data federations, trans-national access, governance, legal, user engagement, training
- e-Infras are pathways to
  - National infrastructure implementation (and alignment)
  - RPOs
- e-Infras co-design and co-develop new services with researchers/users
  - Have close ties with research communities through projects, collaborations, background, trust
  - Community independent but cross community experience
  - Enhances community collaboration

e-Infrastructures - role in EOSC and beyond

- A cross-infrastructure integrated access channel to e-Infrastructures for better user experience
- Human network of experts at pan-European level for technical support
- A collaboration framework that brings e-Infrastructure and Research-Infrastructures at national and European level together
  - e-Infras participate in many (if not all) infraeosc , infratech projects
- Tie into other Data Spaces (e.g. Health, Green Deal, Language), SME's and global connections (e.g. Latin America, Africa, Japan, US, China, …)
- Value to EOSC
  - Strong European initiatives pooling and integrating national investments

> The network, capabilities and services by the e-infrastructures is the most integrated and inclusive offer for research and EOSC

e-Infrastructures - established capacity

- e-Infrastructures and services are available and operational
  - Researchers already use established services in EOSC e.g. AAI, PID, Knowledge Graph,. . . provided by e-Infrastructures
  - Continue to facilitate and enable access to EOSC e.g through the EU node
  - Key services need to be operated and steadily updated (*security) and enhanced (*new technology/needs)

> The network, capabilities and services for EOSC nodes are already provided by the e-infrastructures

- caveat: e-infrastructures are a fixture in European research but do not have a funding program.
  - To sustain a solid long term future for EOSC
  - To evolve the federation and continue to bridge research requirements and IT support & development
  - To continue to facilitate and integrate access to EOSC

e-Infrastructures request from EOSC

- Utilise existing e-Infra capabilities
  - support them to co-exist, align and take them to the next phase to support the federation
- Provide a framework for data collaborations
  - Instead of bilateral agreements
- Enable integration and federation and data competence
  - Drive standardisation and interoperability
- Support for national expert human networks
  - to be coordinated at pan-European level

Thank you

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