Progress Towards Open Science

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Facing the Problems

- Complex histories
- Isolation
- Working in silos
- Fear of the unknown
- Brain drain

History of Projects – just a bit of

- Evolution of infrastructure projects
- Basic network connectivity
  - Networking infrastructure
  - SEE-FIRE, SEEREN, SEEREN2
- Scientific computing infrastructure
  - GRID computing
  - SEE-GRID, SEE-GRID-2, SEE-GRID-SCI, EGI-InSPIRE
- Advanced research environments
  - Scientists and cooperation in focus
  - HP-SEE, VI-SEEM

History of Projects - Effects

- Evolution of our infrastructure
- Basic network connectivity
  - Brought optical networking in academic environment
  - Enabled modern communication
- Scientific computing infrastructure
  - Spreading the infrastructure
  - Spreading the ideas of sharing and cooperating
- Advanced research environments
  - Aiming for wider social effects
  - Opening up for better

Regional Infrastructure - Overview

- Current infrastructure
  - 23.694 CPU-cores, 1.166.592 GPU-cores, 20.496 Xeon Phi-cores, 3.112 Grid CPU-cores, 14.152 Cloud VM-cores, 18 PB of storage
  - Over 200 applications and services
  - Developed together
- Extensive human network
  - Covers wide range of stakeholders
  - “Battle tested” in previous projects

What is EOSC and why should I care?

- Cores and terabytes are nice – but how do **I** use them for **my** research? Wrong question!
- How do **we cooperate** to advance **together**?
- **E**uropean **O**pen **S**cience **C**loud
  - Open up and share!
  - **Every scientist** should be able to simply use **any resource** needed
  - Make data **F**indable, **A**ccessible, **I**nteroperable and **R**eusable

European Open Science Cloud

- European infrastructure
  - But is global in nature
- Federation of infrastructures
  - Greater than the sum of its parts
- Human expertise, standards and resources
  - Long-term stewardship
- EOSC-Hub
  - One stop shop for major European infrastructures

NI4OS-Europe Map

NI4OS-Europe Objectives

- Support EOSC governance framework
  - By working on national level
  - Analyze current landscape => form initiatives
- Facilitate the federation of existing infrastructures and state-of-the-art services
  - Help ease the transition of existing tools
  - Best practices, testing and validation
- Access services through EOSC portal
  - Integrate relevant non-commercial services
  - Generic and thematic services and repositories

Objectives (cont.)

- Support Open Research Data Management and its implementation
  - Define and adapt guidelines
  - Develop easy-to-use tools
  - Establish reliable certification schemes
- Engagement of the targeted communities and validation of the project solutions
  - Cross-country inter-disciplinary demonstrators
  - Training programs and capacity building
  - Uptake of EOSC guidelines and FAIR principles across the widest possible community

NI4OS-Europe for us

- Enable providers to become a part of probably the most important project and infrastructure
- Enable scientists to access the best available resources, data and expertise
  - Imagine the frustration of scientist researching Bose-Einstein Condensates in Banja Luka or Sarajevo
  - I want to do deep learning – but where do I find 16 Tesla cards?
  - I have created an amazing collection of cultural heritage multimedia content – but where and how do I publish terabytes of data?

We can help

- **Always open for cooperation**
  - And always looking for new partners
- Expertise needed to solve your problems
  - If we don’t know – we know who knows
- Provide access to resources
  - In a simple way – you do science – we do tech
- Add your resources to NI4OS and EOSC
  - Share and improve together

But, we need help too

- Help us help you
- Government and policy makers
  - Let's do good together
- Include Open Science in policies
  - Initial effort already under way
- Provide incentives for scientists
  - Make Open Science desirable and attainable
- Support our efforts and nascent infrastructures
  - Small investment towards a brighter future
  - Highways of the future are made of data