



# PaNOSC Closing Event

Paving the way towards the PaN FAIR Data Commons

29-30 November 2022

Grenoble - France

## Interim Progress Report of the EOSC Association Financial Sustainability Task Force

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30 November 2022



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# Interim Progress Report



Now available from:

<https://www.eosc.eu/advisory-groups/financial-sustainability>

<https://www.eosc.eu/sites/default/files/2022-11/financial-sustainability-tf-progress-report-nov-2022.pdf>

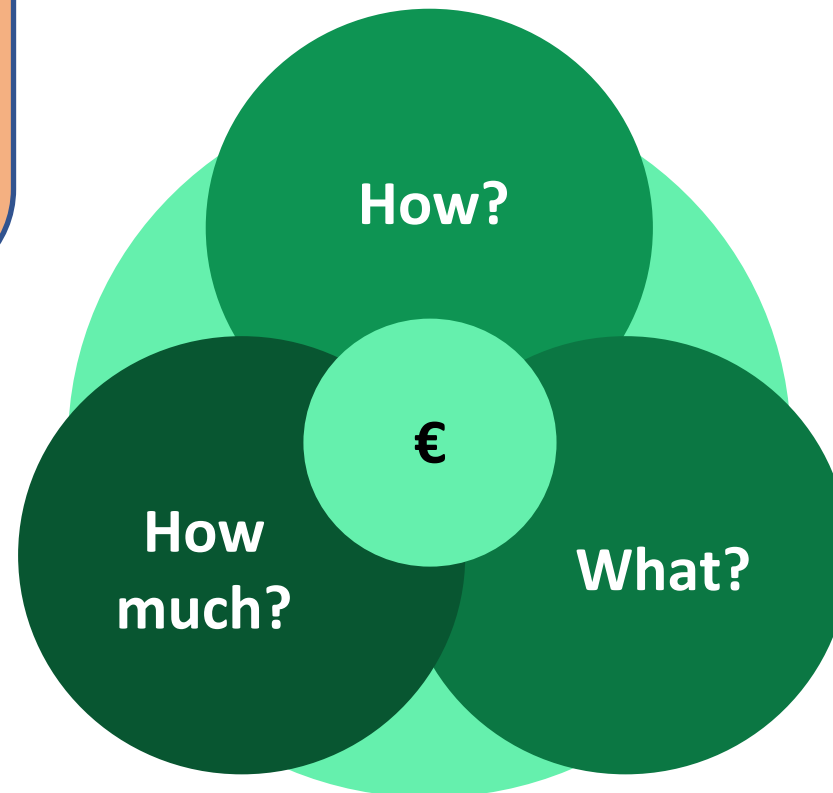
<https://doi.org/10.5281/zenodo.7318481>

# Direction of work

## Objective

Proposal for long term (2027+) financial sustainability of main EOSC building blocks:

- EOSC-Core
- EOSC-Exchange
- Federation of Data



**! Interim Report !**  
reflects current status  
TF mandate 2023

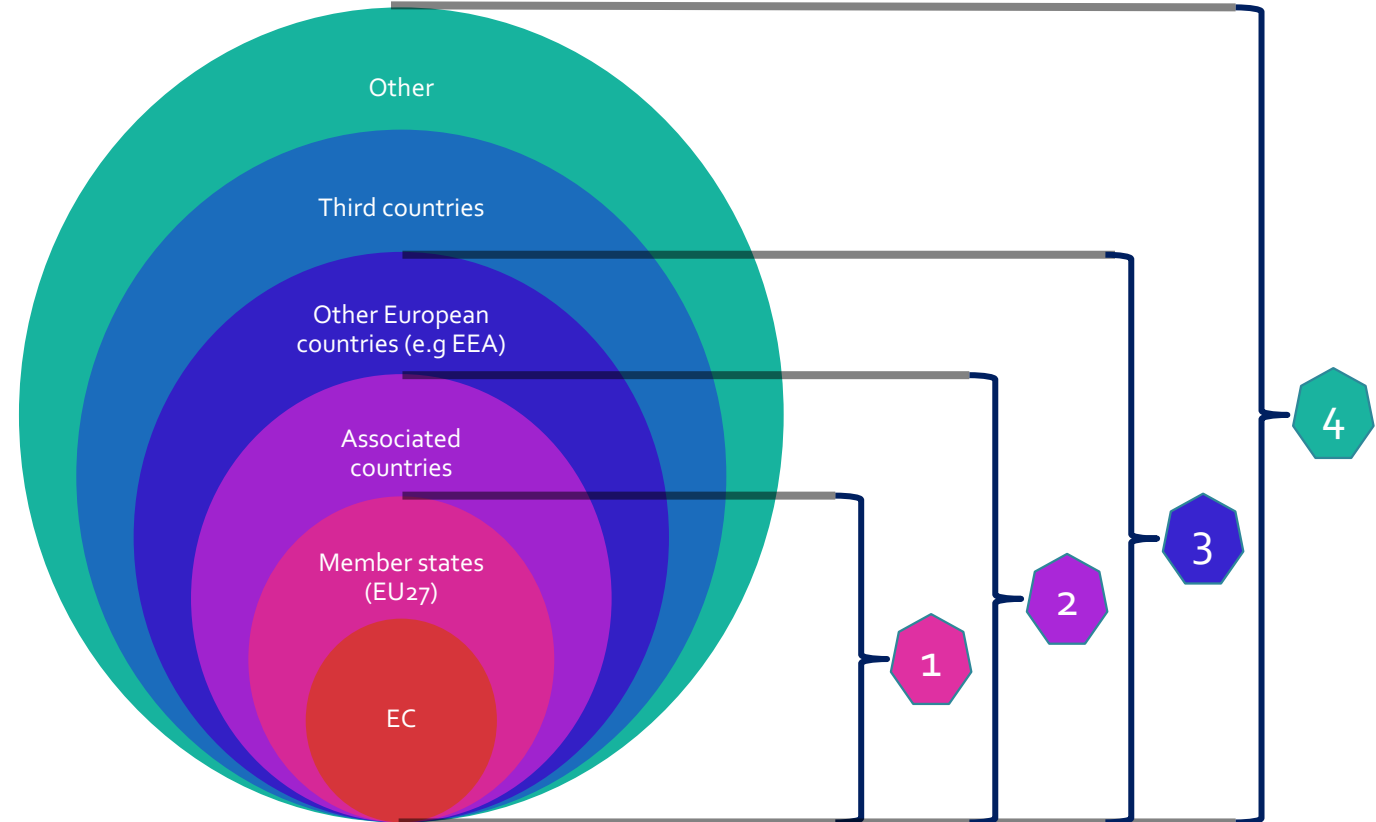
basis for consultation

# Proposal for the EOSC Core

The EOSC Core should be funded and governed by member states and the EC, in a proportion to be defined

- The operational cost of the EOSC Core is to be funded jointly by the EC and Member states for the core to be sustainable (Area 1)
- Associated Countries should be able to contribute financially to the Core (Area 2)
- Financial contributions from third countries and others should be considered as additional sources of revenue (i.e. non-essential for operating the Core) (Areas 3 and 4)
- In-kind contributions may be considered but do not confer the right to be exempted from the financial contribution

- The governance of the core should comprise the Member States and the EC (Area 1)
- Intergovernmental organisations such as ERICs and EIROs which represent large RIs and bigger organised research communities should also take part in the governance
- The involvement of Associated Countries (Area 2) may be considered
- Involvement of EEA countries (Area 3) and other third countries (Area 4) in advisory and even executive bodies may be considered



- Contributions by MS and the EC (and possibly Associated Countries) should provide 100% of the operation and maintenance costs of the Core

- The governance of the core may have a different scheme from that of the Exchange and Federation of Data

## Who should fund the EOSC Core?

- The Core should be funded by public money provided by the EC and Member States
- The Member States' contributions should be agreed once the legal instrument is selected
- Additional funding streams, e.g. by third countries, not precluded but should not be necessary to cover the operating costs of the Core
- In-kind contributions should not give the right to waive the financial contribution
- Incentive for others (third countries) to pay a contribution needs to be addressed

## Access for all

- The MS may wish to install a mechanism (for example removal of voting rights in the governance) to prevent a misuse of the EOSC Core model, where the majority use the Core while just a few contribute financially, but emphasises that all European researchers should be able to benefit from data and services in EOSC

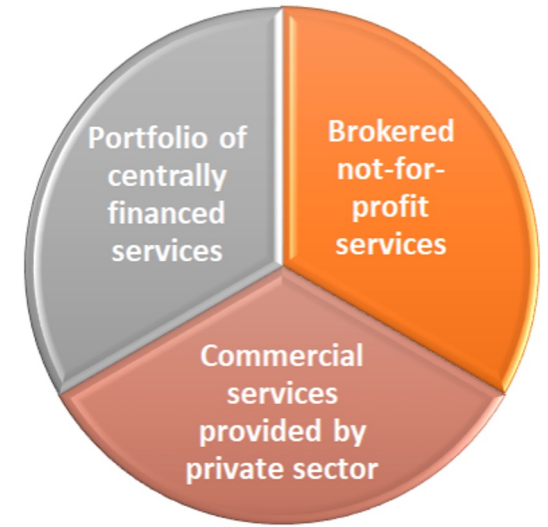
## Who should govern the EOSC Core?

- Joint ownership goes hand-in-hand with joint funding of EOSC Core
- Co-ownership and co-funding has several advantages
  - presence of EC balances representation of Member States
  - countries have a voice in governance and are co-responsible for EOSC deployment in their countries
- Research community should be represented
- Commercial providers may participate in a non-voting capacity

# Proposals for the EOSC Exchange

## Definition/Scope of EOSC Exchange in context of financial sustainability

- Insufficient definition required TF to do further work before diving into potential financial models
- TF's view: the Exchange as EOSC's pan-European marketplace for research services
  - Value proposition: Researchers should have freedom of choice to use the services from the Exchange that best fit the researcher's problem
  - Exchange has to facilitate cross-border service consumption, contribute to better services emerging through competition, and provide a fertile ground for niche services
  - enables the brokering of horizontal and thematic services between providers and researchers

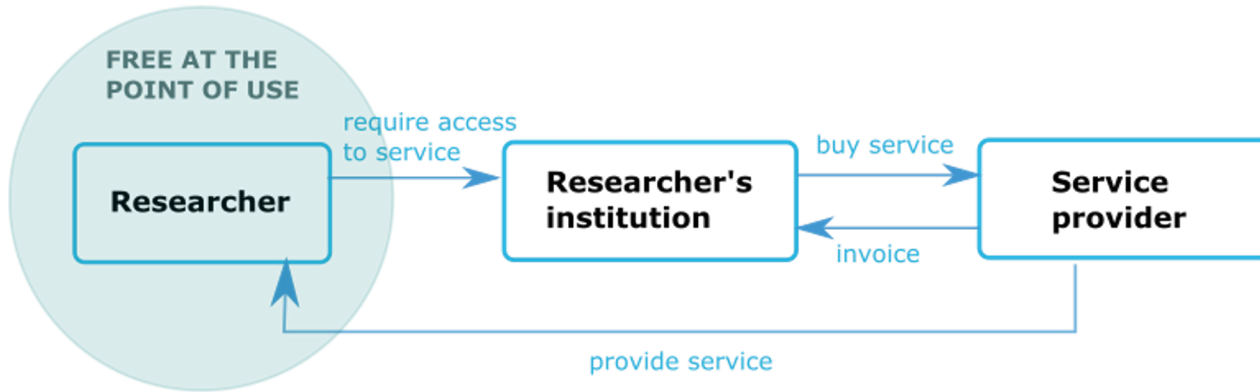


<b>Centrally financed services</b>	Financed by EOSC. This category is divided into two subsets: <ul style="list-style-type: none"> <li>- a selective portfolio of essential services (horizontal and thematic)</li> <li>- a small set of temporarily subsidised services to initiate take-up in the research community</li> </ul>
<b>Access to commercial services</b>	Procurement-compliant access to contracts with research-relevant commercial services
<b>Brokered not-for-profit services</b>	Largest and most dynamic category. Not-for-profit services brokered between the thousands of organisational participants in EOSC



# Proposals for the EOSC Exchange

Brokered not-for-profit services



**Possible financial transaction mechanism,  
e.g. via subscription model**

- Biggest category in EOSC Exchange: thousands of public sector EOSC participants can offer services to each other
  - horizontal and thematic services
- marketplace facilitates service transactions and cost recovery mechanisms
  - services free at the point of use for researchers
- potential direct and indirect cost recovery mechanisms (mutually non-exclusive)
  - voucher/token model
  - subscription
  - freemium model
  - ...
- Two major challenges:
  - VAT
  - Procurement
- more in-depth analysis required

# Data Federation in EOSC

## Definition & Current situation

- TF's view: EOSC DF must enable researchers to find and acquire data from multiple sources available at any level of aggregation (local/institutional, national, thematic, EU, international) through attribute-based discovery
- Principle of data federation: *[federated architecture]: loosely coupled or decentralised cooperating components, interconnected in a way that allows interoperability and information sharing*  
[https://en.wikipedia.org/wiki/Federated\\_architecture](https://en.wikipedia.org/wiki/Federated_architecture)
- SRIA definition of EOSC DF: *EOSC will be primarily a federation of existing data and services where data remain in their current repositories and EOSC provides a means to make those data more broadly discoverable and interoperable (SRIA)*

**! Problem: Costs associated with federating data, FAIRification or EOSC-compliance frequently not included in research budgets**

## Lessons learned from use cases



- ⇒ **Data and services must go together** but have different financial requirements
- ⇒ **Interoperability** required
- ⇒ **Rely on existing repositories and (FAIR) federations** and on all levels and make them discoverable
- ⇒ **Use existing infrastructures** and thematic ecosystems to avoid duplicating efforts
- ⇒ Connect with **European Common Data Spaces, Gaia-X, Global Open Science Cloud**
- ⇒ **Establishing EOSC globally** will help encourage funding through increased competitiveness and international visibility



# Data Federation in EOSC

## Additional Cost Categories

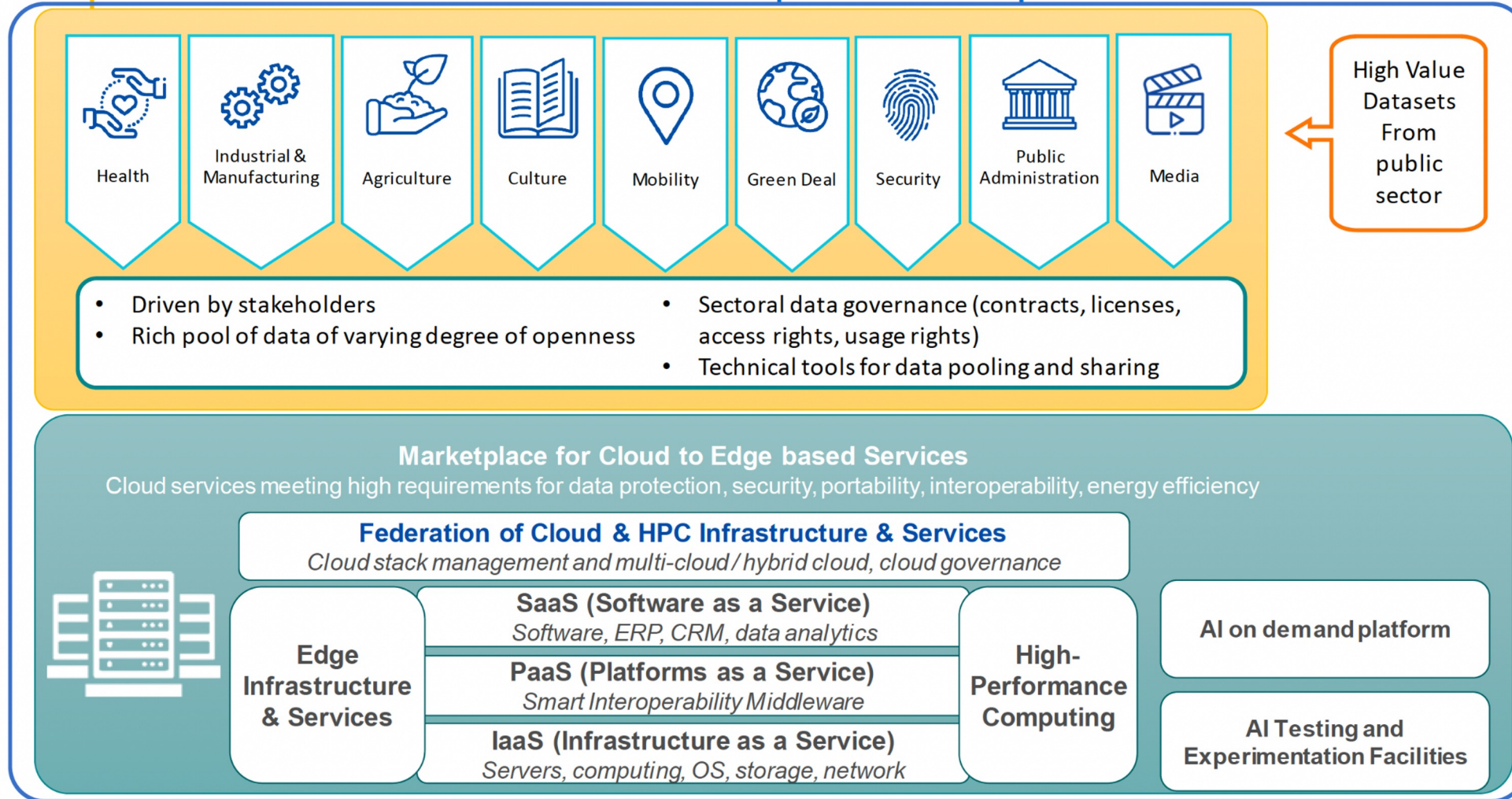
<i>Making data FAIR</i>	<i>Making experiments reproducible</i>	<i>Ensuring long-term access to data</i>	<i>Federating data to EOSC</i>
<p>Operational Costs</p> <ul style="list-style-type: none"> <li>• Data Stewardship</li> <li>• Control Systems to acquire metadata</li> <li>• Storage</li> <li>• Data transfer</li> <li>• Access to computing</li> <li>• Making data findable</li> </ul> <p>Development costs</p> <ul style="list-style-type: none"> <li>• Capture metadata</li> <li>• Improve data reduction</li> </ul> <p>Legacy → FAIR-data</p>	<p>Workflows and software</p> <p>Data analysis environments</p> <p>Software catalogues</p> <p>Computing capacity to run data analysis</p> <p>Data transfer protocols</p>	<p>Storage &amp; archival costs for sustainable repositories</p> <p>Update of metadata and APIs</p> <p>Connect endpoints and make data findable via data catalogues across Europe</p> <p>Tools &amp; services to make data FAIR</p>	<p>Creating links &amp; enabling interoperability between data resources and EOSC APIs</p> <p>Operational costs of interoperability</p> <p>Data deduplication</p> <p>Data harmonisation</p> <p>Alignment of metadata schemas</p> <p>Certification &amp; validation of repositories</p> <p>Legal &amp; ethical (sensitive data)</p>

## Some Possible Architecture Models

Solution	Main characteristics
<p><b>Overlay</b></p> <p>Intermediary software layer in addition to any federation layers existing in a scientific domain or geographical area</p>	<p>Centrally managed and maintained by EOSC</p> <p>Enables data discovery from any provider</p> <p>Ensures data interoperability to the highest degree possible</p>
<p><b>Metadata catalogue</b></p> <p>System to track metadata organised into a catalogue</p>	<p>Strong contribution to interoperability</p>
<p><b>Catalogue of data providers and platforms</b></p> <p>Compilation of providers, platforms, and how to access them</p>	<p><b>Less likely</b> to achieve interoperability</p>
<p><b>Natural evolution</b></p> <p>Default solution in the absence of EOSC</p>	<p>Existing data infrastructures remain as go-to sources</p> <p>Convergence expected to still occur but uncoordinated and slow; involves significant costs</p>

# Funding Framework for Data Infrastructure?

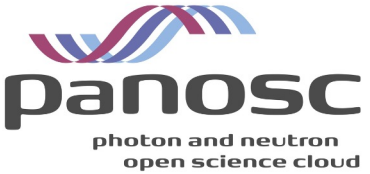
## Cloud Federation, common European data spaces and AI

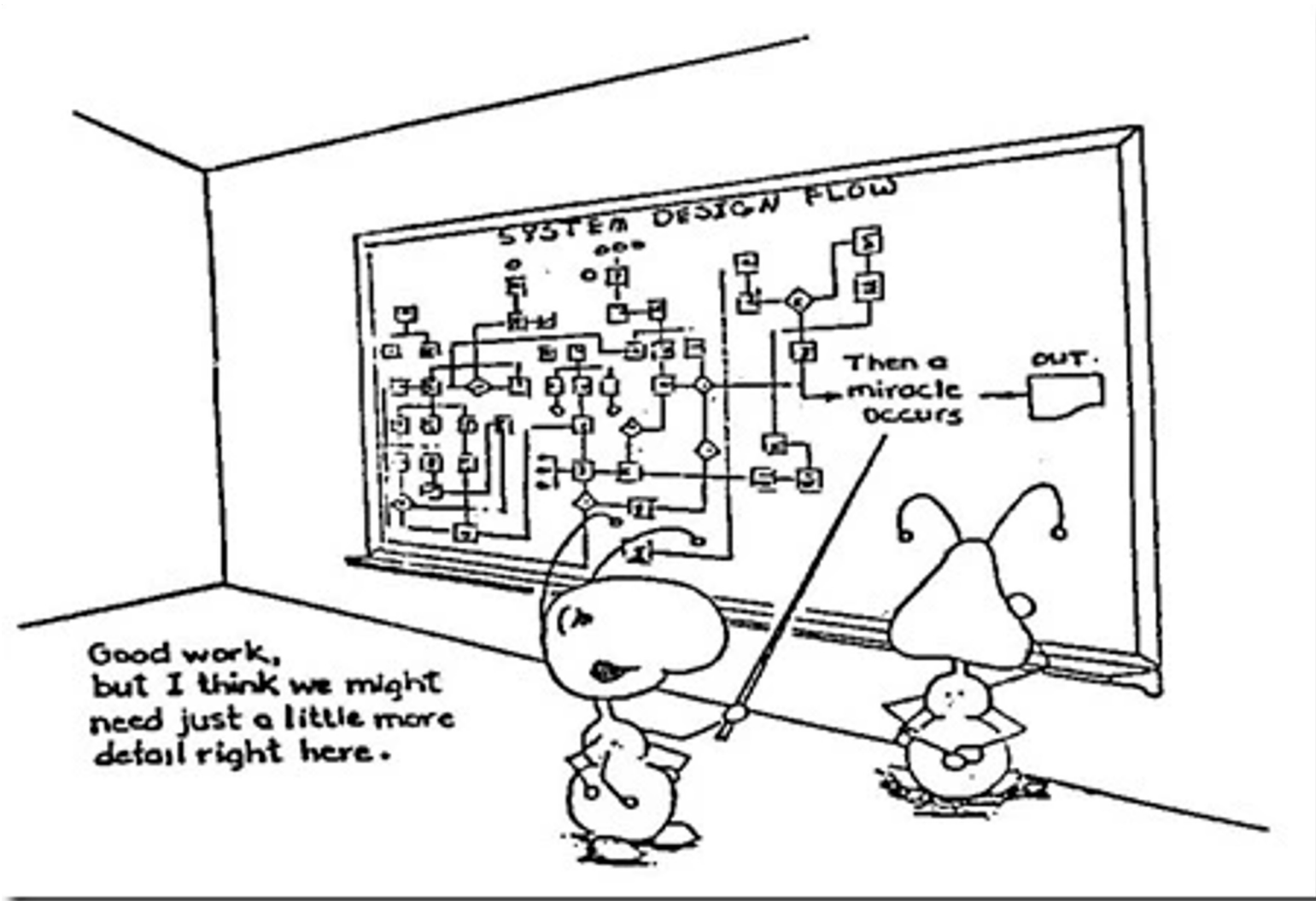


# Research Infrastructures in EOSC



ExPaNDS









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## Thank you

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EGI: Advanced Computing for Research



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