FAIR4Fusion – Introducing FAIR Principles to Fusion

Authors : Shaun de Witt (UKAEA) David Coster (IPP) Frederic Imbeaux (CEA) Marcin Plociennik (PSNC) Par Strand (Chalmers) Iraklis Klampanos (NCSR-D)

This project has received funding from the Euratom research and training programme 2014-2018 under grant agreement No 847612

Background

- About the Project
  - Funding and Goals
- Why FAIR and What's the current status in fusion?
- Outputs so far

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Fair for Fusion – Open Access for fusion data in Europe

- Project duration: 24 months

(2019-2021)

- Total budget: € 1 987 960

Consortium: 7 partners

Project website: https://fair4fusion.eu/

In Fair4Fusion we work on:

- Comprehensive assessments of **FAIR data requirements and open data issues** in fusion programme
- **Recommendations on the best technical approaches** for providing access to data
- Development of **support platforms and tools required to implement an open data policy** adapted to the needs of the fusion research programme.
- **Pooling the talent and knowledge** from big science programmes and organisations

With the objectives of:

- Further developing tools and platforms needed for an open data approach.
- Raising the profile and awareness of FAIR and open data within the fusion programme.
- Laying the foundations for implementing an **open data policy adapted to the needs of the present and especially the future fusion energy research programme**, particularly in the run up to the operation of ITER from the middle of the next decade.

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Project Structure

EUROfusion

Community Requirements

iter

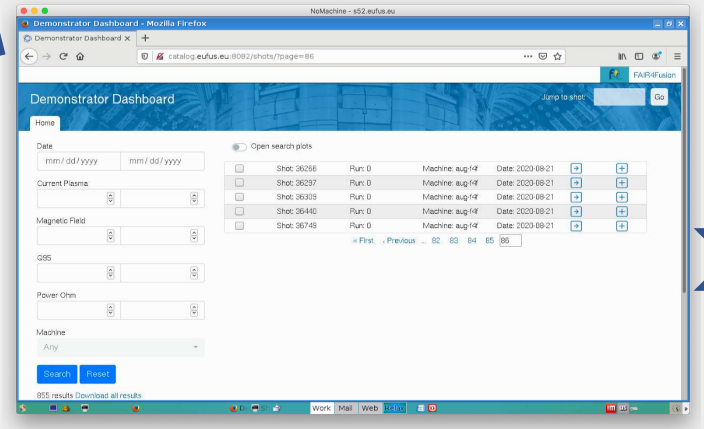
china eu india japan korea russia usa

EIRO forum serving european science

RDA RESEARCH DATA ALLIANCE

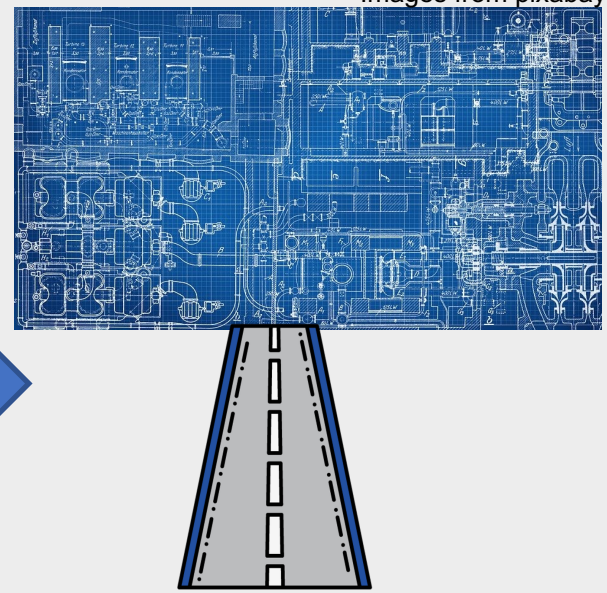
EUROPEAN OPEN SCIENCE CLOUD

Non-Community Requirements



Demonstrators

Images from pixabay



Blueprint and Implementation Roadmap

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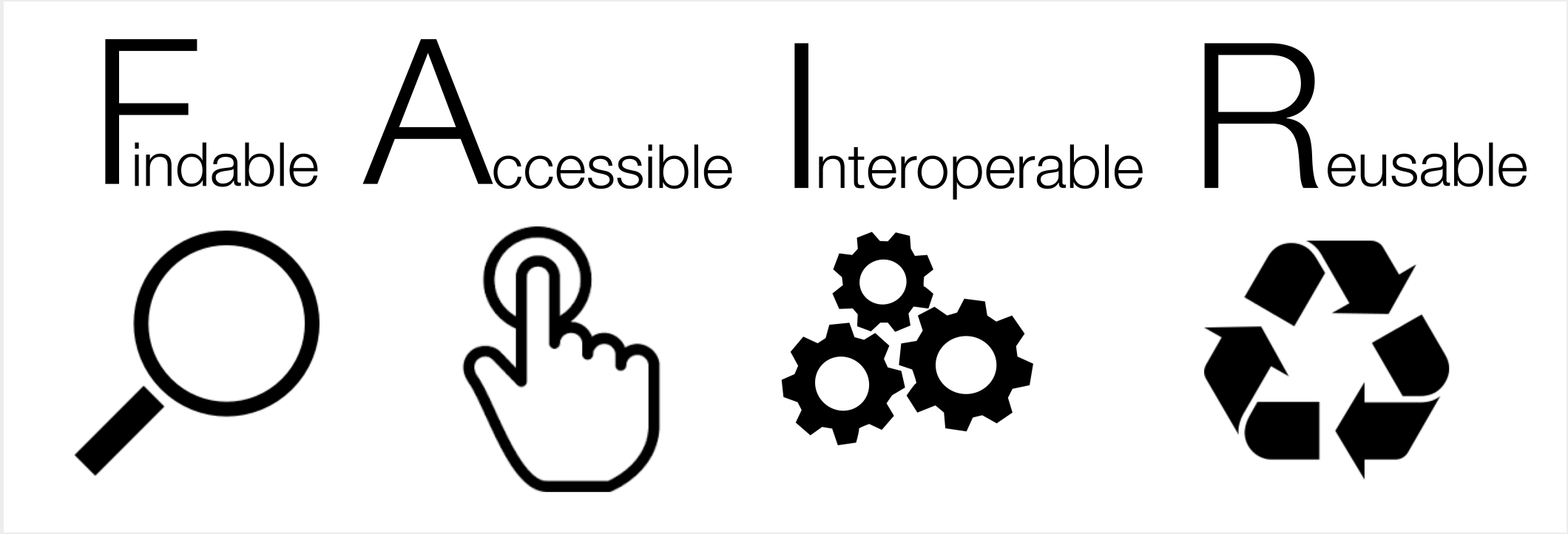

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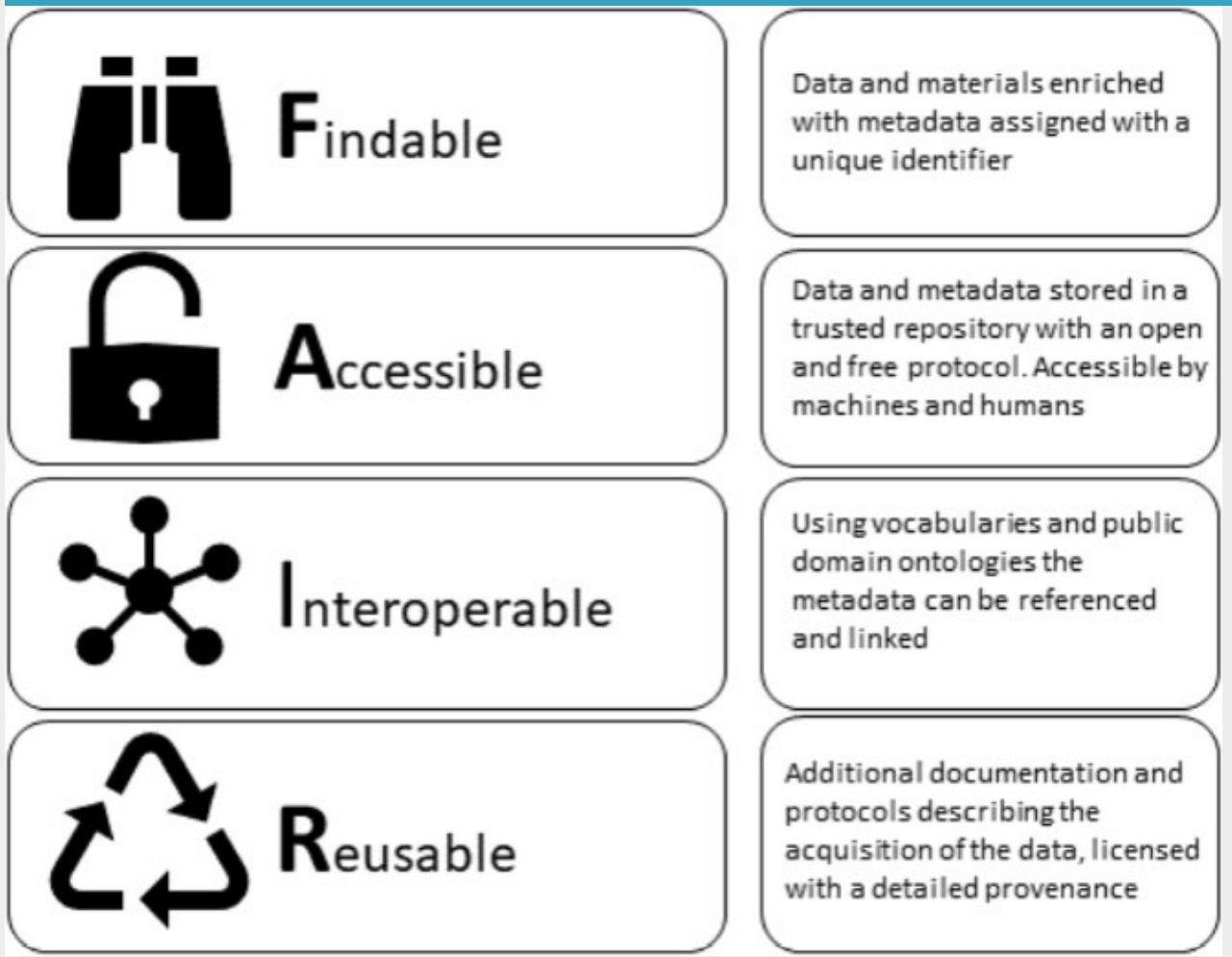
The FAIR Principles and the EU



EU's Open Science Policy in Horizon Europe

Aims for open science policy under Horizon Europe

- ensure that **beneficiaries retain the intellectual property rights they need to comply with their open access obligations**
- **require research data to be FAIR and open by default (with exceptions notably for commercial purposes)**
- **promote the adoption of open science practices**, from sharing research outputs as early and widely as possibly, to citizen science, and developing new indicators for evaluation research and rewarding researchers
- engage and involve citizens, civil society organisations and end-users in co-design and co-creation processes and promote responsible research and innovation
- European Open Science Cloud (EOSC) will enter its next stage of development in 2021
- fund the development of an open-access publishing platform to host Horizon 2020 (and later Horizon Europe) beneficiaries' publications

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FAIR and Open

- Rule 1: FAIR data does **not** have to be open
  - FAIR supports institutional closed repositories, or supporting data and information exchange between groups working on the same project
- Rule 2: Open data does **not** have to be FAIR (but it helps)
  - Just because your data is available on the web does not mean it is usable by anyone or indexed by your favourite search engine
- Rule 3: FAIR is **not** binary
  - There are 50 shades of FAIR (or there abouts)
- Rule 4: Open data **does not have to** mean Open Access
  - Registration can still be required

FAIR != Open

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So how FAIR is Experimental Fusion Data?

- Summary of Issues
  - Although there is a community way of identifying data sets, this is **not a persistent identifier**
  - There is a **lack of common metadata standards** and vocabularies
  - Although MDS+ is widely used and open, it is **not a recognized standard**
  - Although sharing of data is done through Acceptable Use Polices, this is not the same as a **license**
  - Although some **provenance** is captured it is **often incomplete and not accessible** to external users via the protocols available
  - There is no common **Authorization and Authentication System**, meaning data access methods are site dependent

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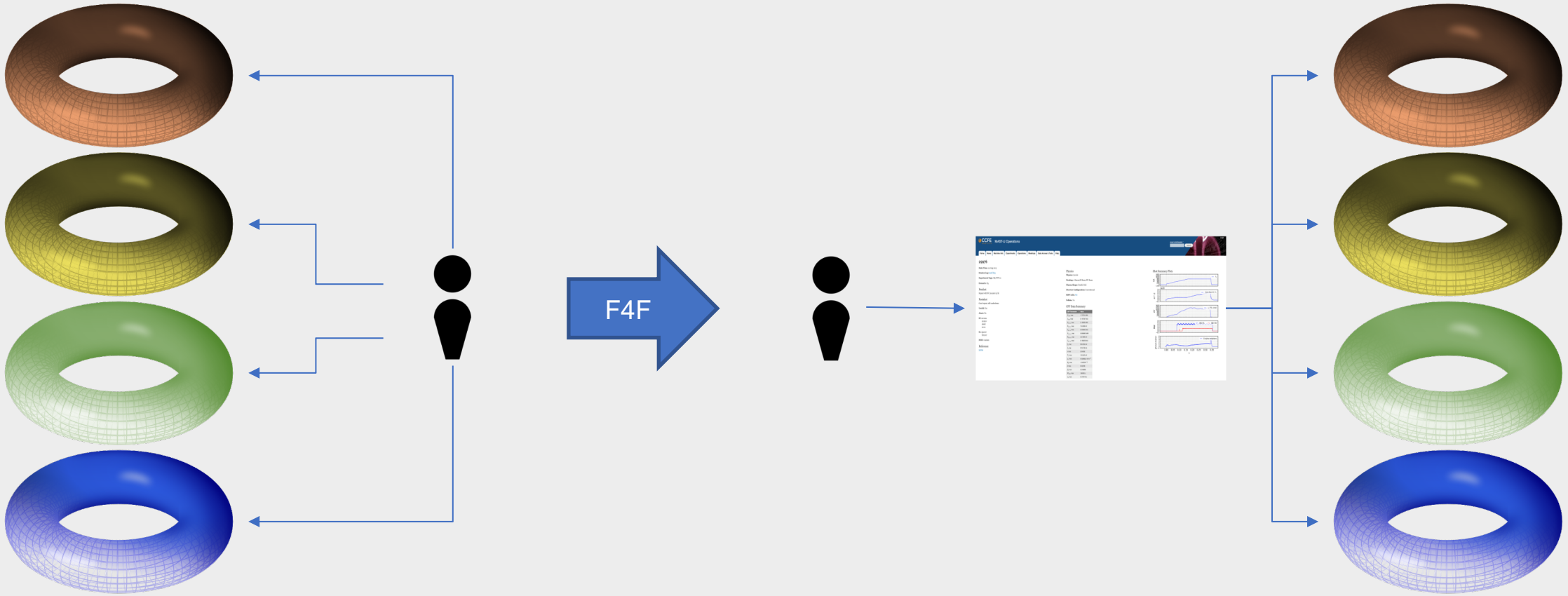
What can FAIR do?



Torus Image © Leonid 2. licensed under the Creative Commons Attribution-Share Alike 3.0 Unported license
Gender Neutral Human by Mithru Vigneshwara from the Noun Project

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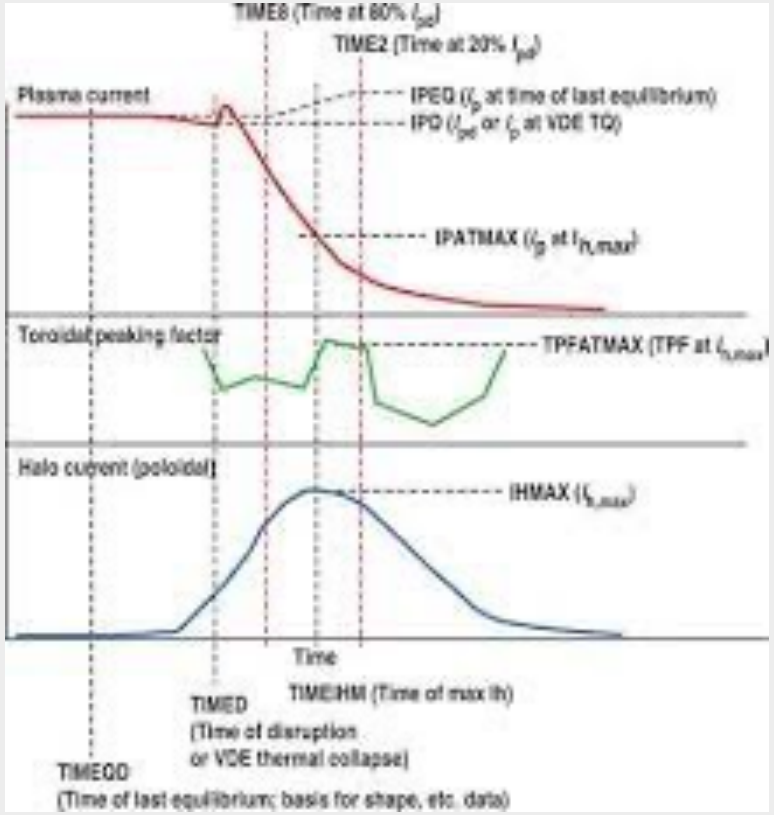
What else can it make easier?

- Many years have gone into creating special databases to make things easier for the researcher
  - Core Confinement
  - Disruption
  - Pedestal
  - Stellerator
- Identifying and automating validation could have saved 5-15% of the effort
- And have any of you tried to find these databases?



.W. Eidietis *et al* 2015 *Nucl. Fusion* **55** 063030

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Outputs of the Project

- Two ‘demonstrators’
  - One built on existing technology; JET dashboard, CatalogQT, Summary IDS
  - One built to test new technologies
  - https://box.psnc.pl/f/aee690aada/ and talk by Michal Owsiak
- Recommendations to make data FAIR
  - And cost modelling
- Blueprint Architecture
  - To produce a fully operational service for the community
  - See talk by Marcin Plociennik

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Some Key Recommendations so far

- Use DataCite or EPIC Handles AS WELL as shot/pass
  - Makes data citable, but issues around granularity and legal entity for hosting
- Use Common Metadata and Ontologies
  - IDS Data Dictionary and Summary IDS represent common ”standards”
- Make data *as open as possible, as closed and necessary*
  - Metadata should be open even if the data isn’t.
- Adopt a community wide Authentication and Authorization Infrastructure
  - White listing is so 20th century and means you can’t embrace the cloud
- Provide a license
  - EU recommend either CC-BY or CC-BY-SA and most EIROForum members use one of these. MAST data released under CC-BY-NC-SA. In discussion with legal experts.

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Questions?

For more please follow us on social media and check the web site for project updates

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