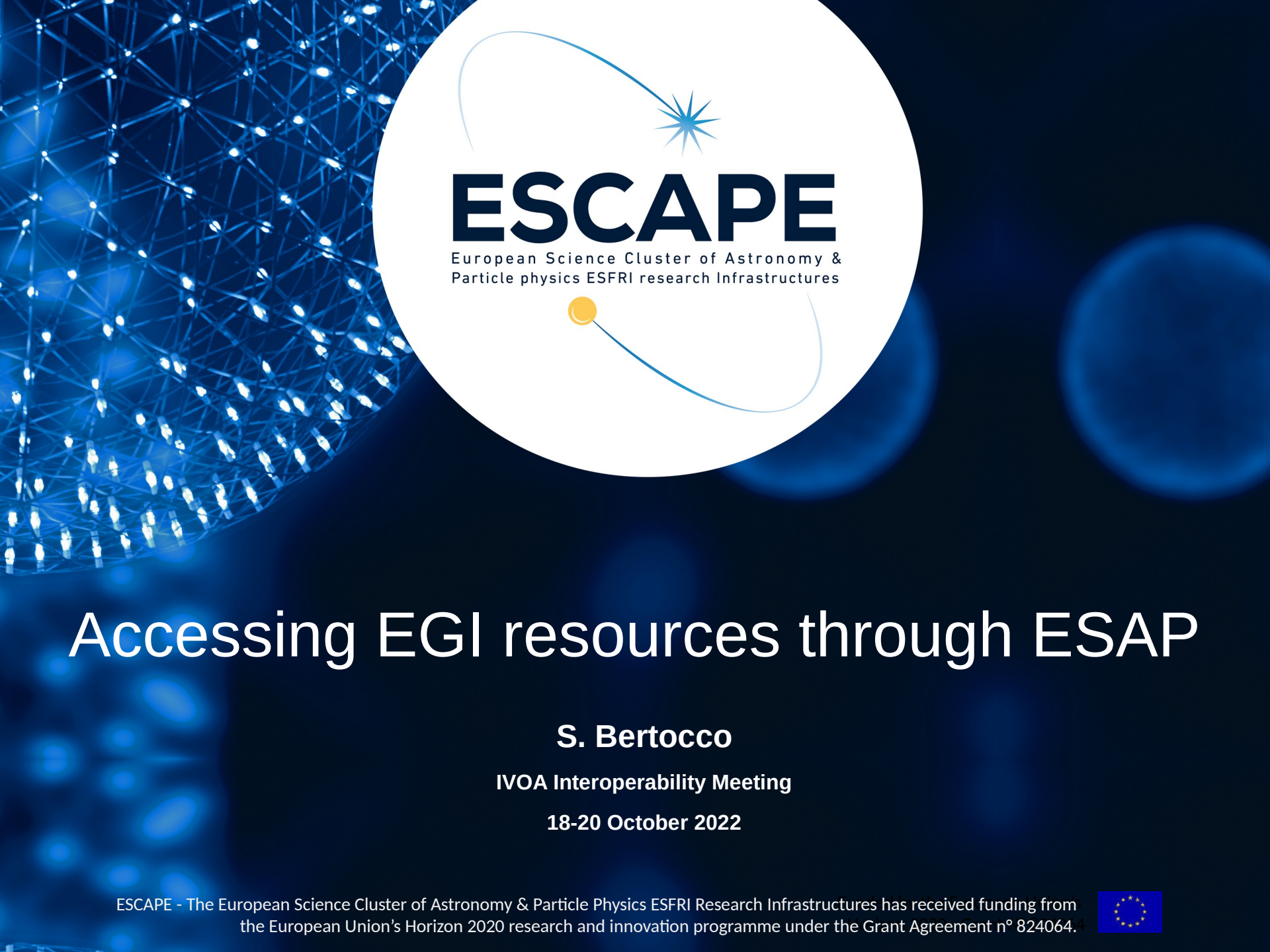

Accessing EGI resources through ESAP

S. Bertocco

IVOA Interoperability Meeting

18-20 October 2022

ESCAPE - The European Science Cluster of Astronomy & Particle Physics ESFRI Research Infrastructures has received funding from the European Union's Horizon 2020 research and innovation programme under the Grant Agreement n° 824064.

ESCAPE EU Project

ESCAPE: European Science Cluster of Astronomy & Particle physics ESFRI research infrastructures.

The project aims to address the Open Science challenges shared by ESFRI facilities (SKA, CTA, KM3Net, EST, ELT, HL-LHC, FAIR) and pan-European research infrastructures (CERN, ESO, JIVE) in astronomy and particle physics.

Connect ESFRI projects to EOSC ensuring integration of data and tools
Establish interoperability within EOSC as an integrated multi-messenger facility for fundamental science.

Funded by the European Union's Horizon 2020 - Grant N° 824064

The ESAP Platform

ESAP: ESFRI Science Analysis Platform.

Flexible science platform for the analysis of open access data available through the EOSC environment. It allows EOSC researchers

- to identify and stage existing data collections for analysis,
- to select among software tools and packages developed by the ESFRIs or bring their own custom workflows to the platform,
- to exploit the underlying computing infrastructure to execute those workflows.

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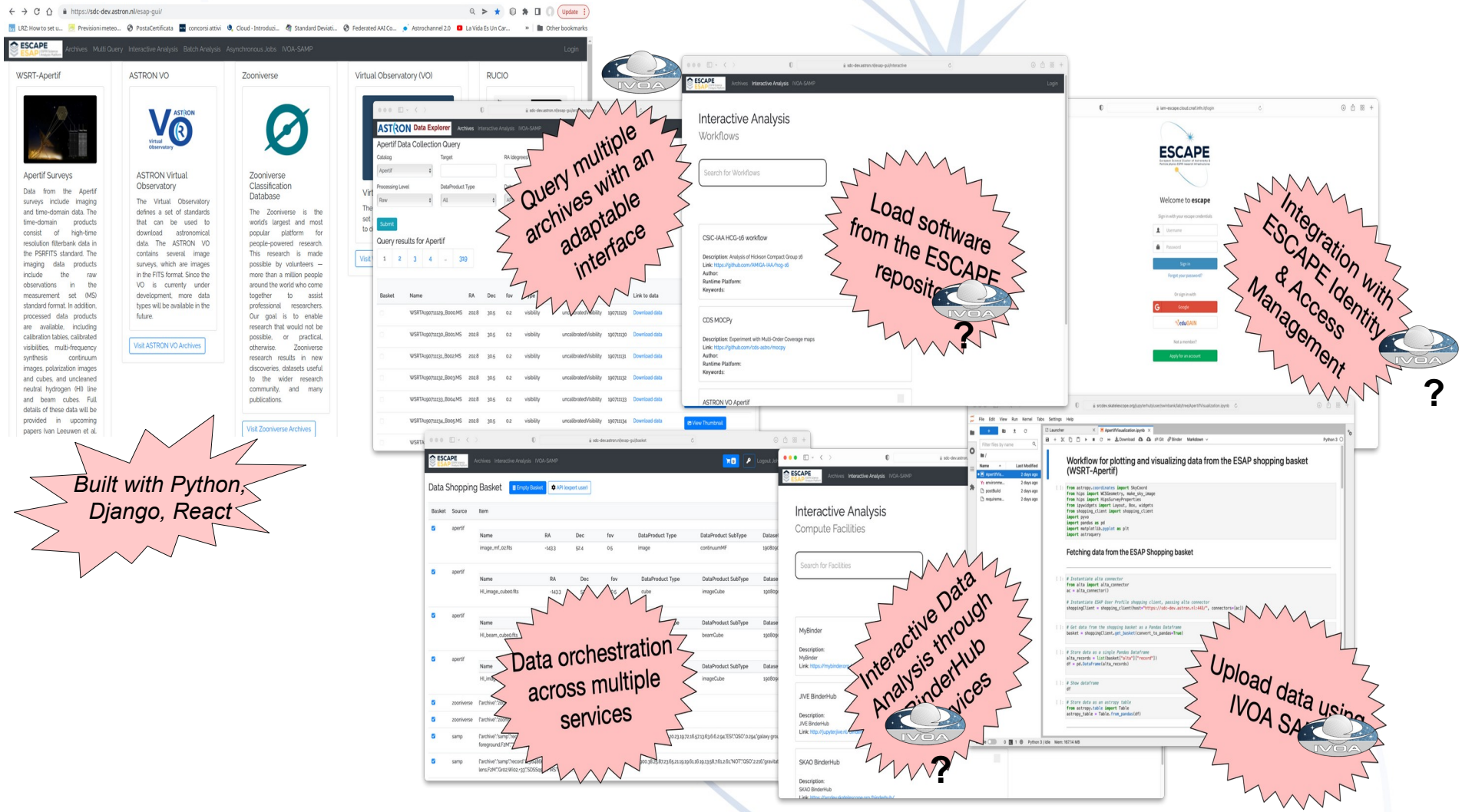
Current Status & Capabilities



Demo system

https://sdc-dev.astron.nl/esap-gui

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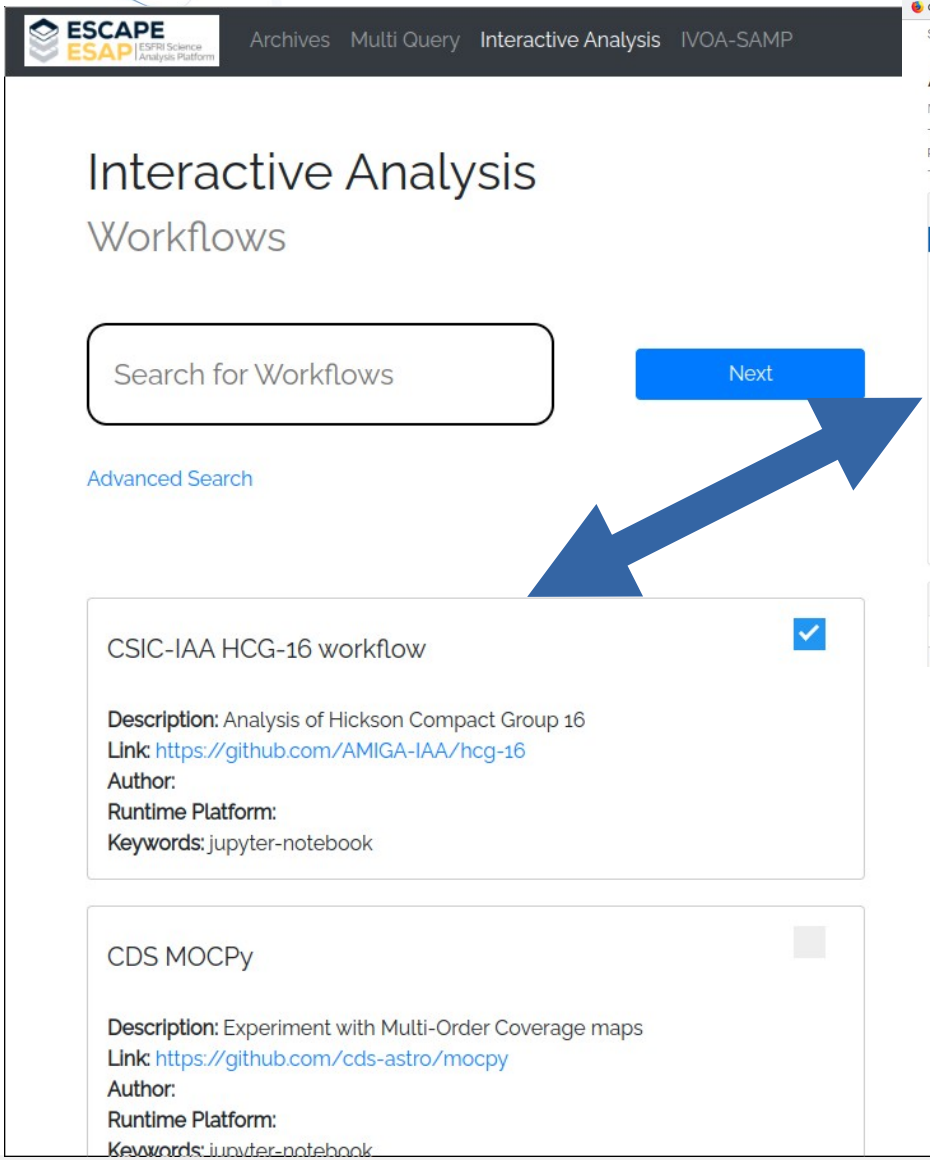
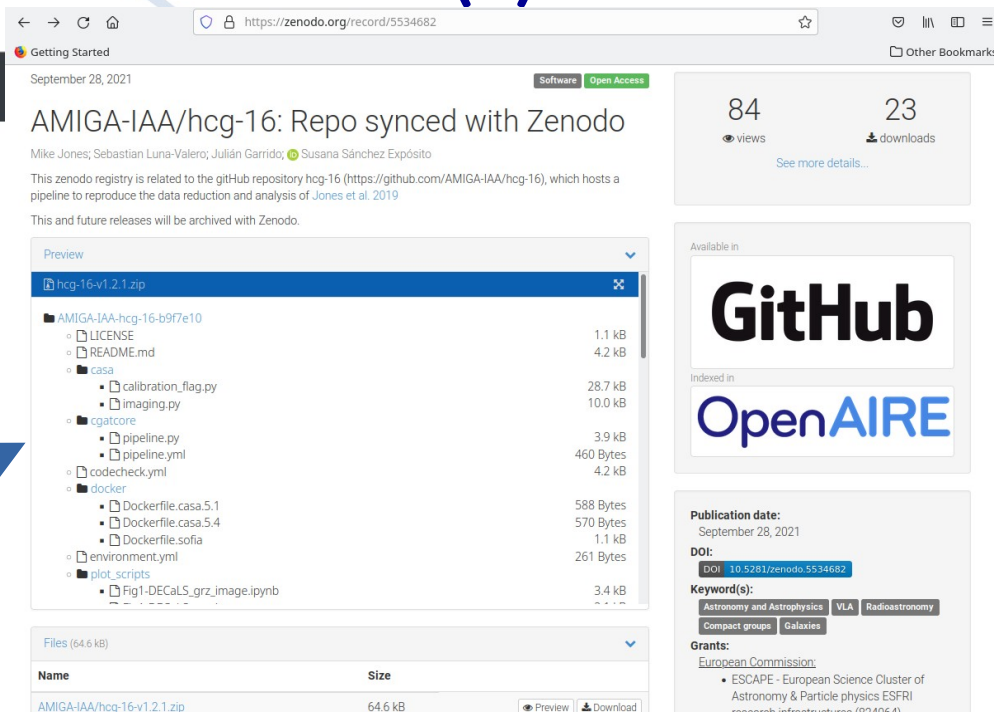
ESAP Software Execution (1)





Workflow metadata description needed:

- OSSR & CEVO working on it
- codemeta.json

https://escape2020.pages.in2p3.fr/wp3/eossr/master/metadata.html

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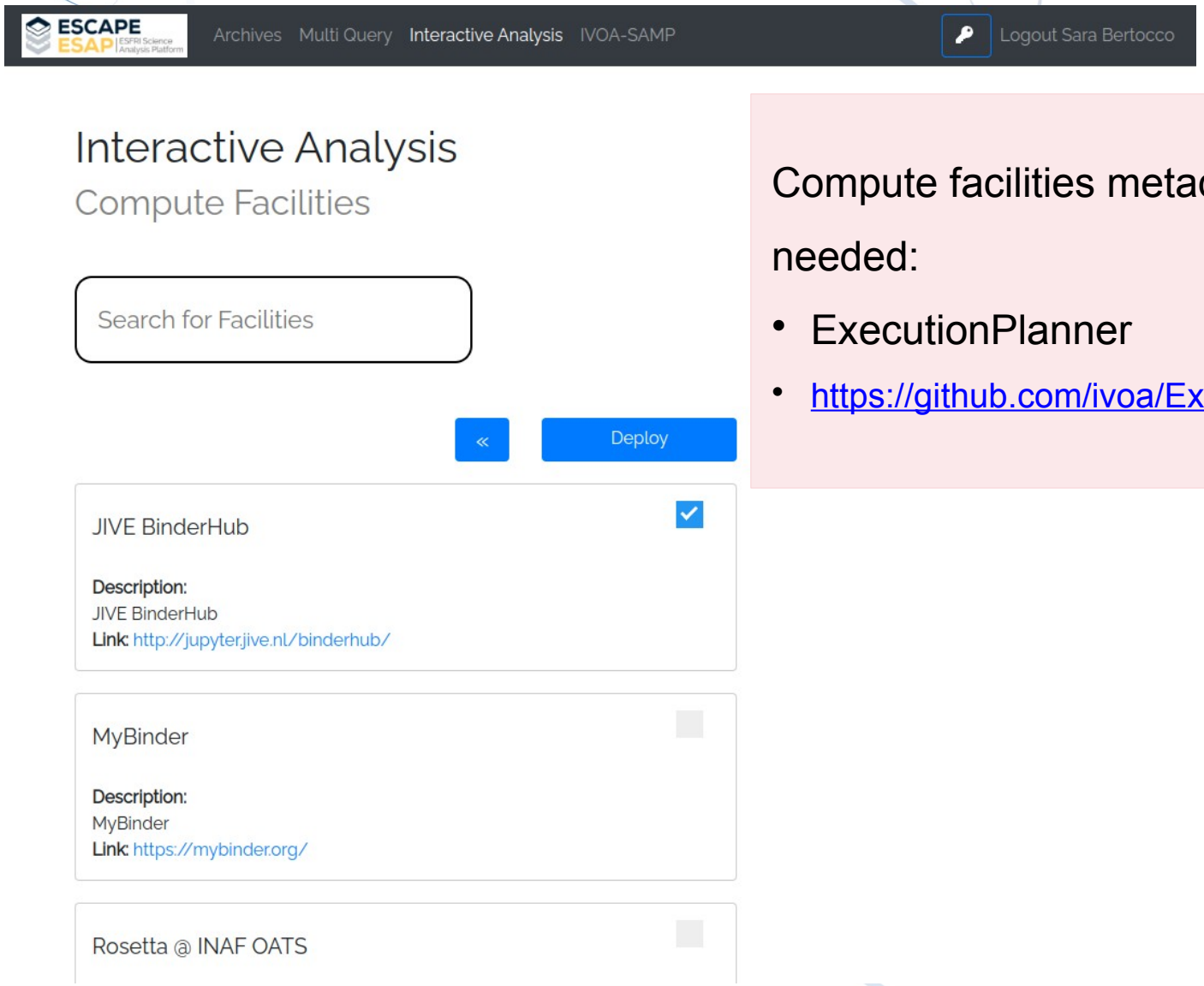
ESAP Software Execution (2)



Compute facilities metadata description needed:

- ExecutionPlanner
- https://github.com/ivoa/ExecutionPlannerNote

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Use Cases

Two use cases:

- provide IVOA services in a container

https://github.com/zarquan/Oligia

- provide an environment to run the workflow to process HI data cubes produced by radio interferometers, in particular large data cubes produced by future instruments like the SKA.

https://hi-friends-sdc2.readthedocs.io/en/latest/

https://github.com/HI-FRIENDS-SDC2/hi-friends

which is a suitable infrastructure to satisfy such use cases ?

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EGI Fedcloud in a nutshell

EGI is a federation of computing and storage resource providers united by the mission to support research and development delivering open solutions for advanced computing and data analytics

The EGI Core is a federation and management platform that pool together various resources: the EGI Federated Cloud Platform (FedCloud)

The EGI cloud compute service gives users the ability to deploy and scale virtual machines on-demand.

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Implementation steps

- register to the Virtual Organisation vo.access.egi.eu
- ask to CESGA site support to be able to allocate needed resources (particularly a public IP)
- write a simple djando web application, to be integrated in ESAP, to automate the virtual machine creation process in the EGI fedcloud
  - following the EGI provided guide

    https://docs.egi.eu/users/getting-started
  - using the EGI federated cloud python client

    https://github.com/tdviet/fedcloudclient

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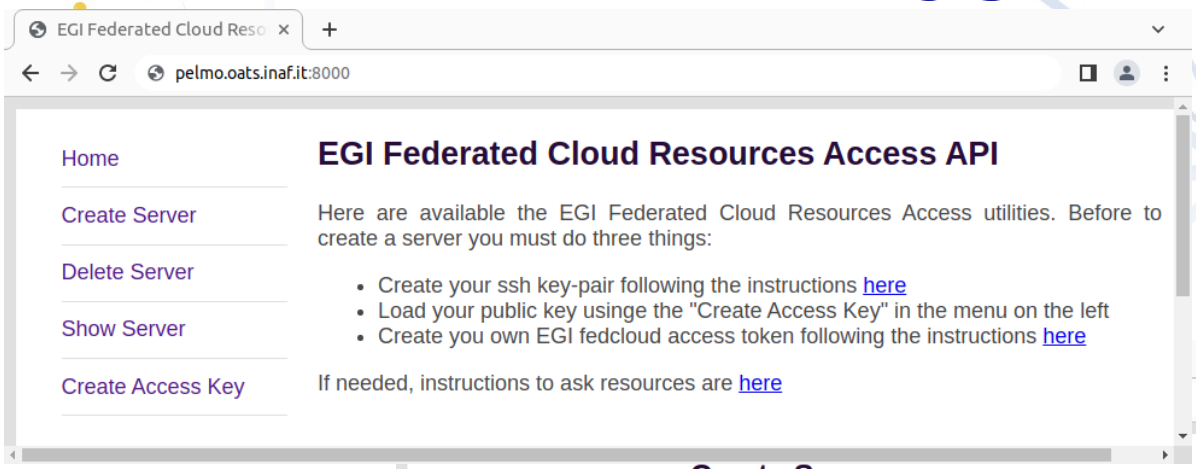
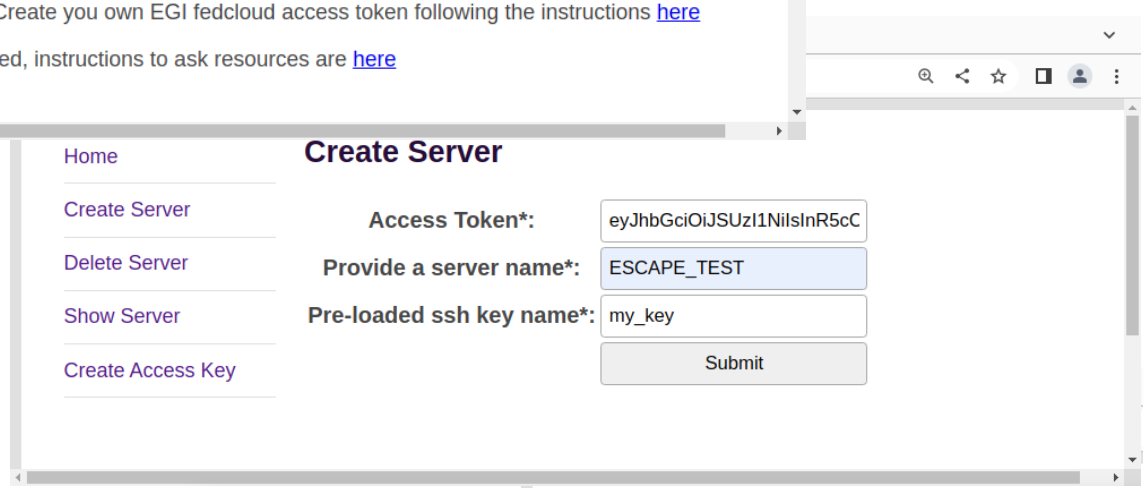
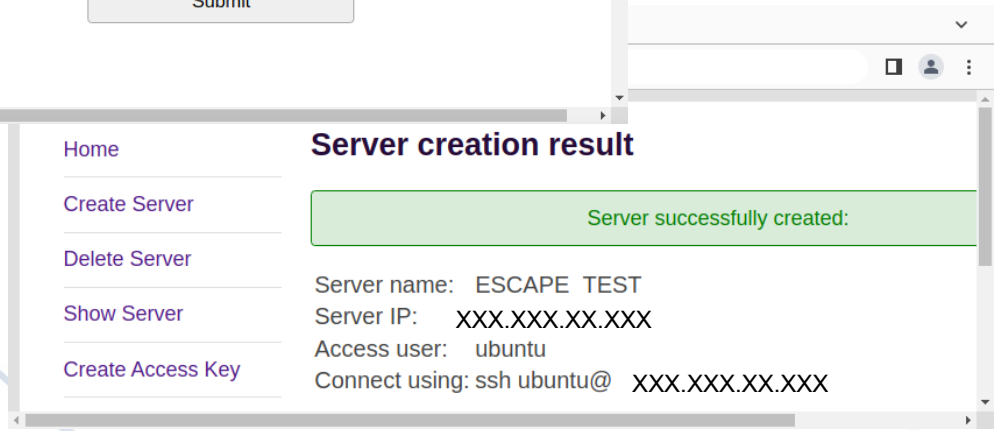
GUI







https://github.com/bertocco/ESCAPE-VM-worker
https://github.com/bertocco/ESCAPE-VM-worker-gui

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Lessons learned

Show stopper in the virtual machine automation process:

1) Public network. Each site has a slightly different network configuration, and there is no standard way to tell which one to use and how to setup the router for it. There is not a convention for the Networks naming → need some guess (human intervention) to understand which is a public network.

2) Supported Virtual Organizations. There is not a command in openstack or in the Fedcloud tool that lists the sites that support a certain virtual organisation.

3) Flavours and images: it is needed to guess (human intervention) the resources associated to the flavors or the Operative System in an image. A naming convention could be useful. Possible solution forflavours: to use ‘list’ and ‘show’ commands in association to create a configuration information file.

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Authentication and Authorization thoughts

- ESCAPE-ESAP A&A managed with INDIGO-IAM
  https://indigo-iam.github.io/v/current/docs/
  Project deployment:
  https://iam-escape.cloud.cnaf.infn.it/login

- EGI FedCloud A&A managed with EGI Check-in
  https://docs.egi.eu/users/aai/check-in/
  EGI Check-in as a service:
  https://aai.egi.eu/registry/

Both: OpenID Connect, JWT token, group membership

Could them interoperate? and with IVOA compliant A&A?

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Interoperability with IVOA compliant A&A?

Authentication: mapping between tokens?

Authorization: GMS defines a REST API that answers the question: Is this user a member of this group?

The GMS service having the group information is identified and queried through the group name. Group URI example: ivo://oats.inaf.it/gms?MyGroup.

The IAM token contains the ISS (issuer field):

“iss”: “https://iam-dem.cnaf.infn.it/”

and an introspection endpoint containing (also) groups informations

https://iam-dem.cnaf.infn.it/introspect

https://agenda.infn.it/event/20847/contributions/108730/attachments/69792/86836/IAM-corso-big-data.pdf

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ESCAPE

European Science Cluster of Astronomy &
Particle physics ESFRI research Infrastructures

Thank you !

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Backup Slides

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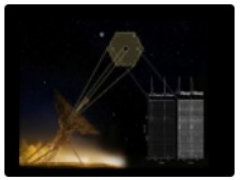
ESAP features

https://sdc-dev.astron.nl/esap-gui/

ESCAPE ESAP | Archives | Multi Query | Interactive Analysis | Batch Analysis | Asynchronous Jobs | IVOA-SAMP | Login

WSRT-Apertif



Apertif Surveys

Data from the Apertif surveys include imaging and time-domain data. The time-domain products consist of high-time resolution filterbank data in the PSRFITS standard. The imaging data products include the raw observations in the measurement set (MS) standard format. In addition, processed data products are available, including calibration tables, calibrated visibilities, multi-frequency synthesis continuum images, polarization images and cubes, and uncleaned neutral hydrogen (HI) line and beam cubes. Full details of these data will be provided in upcoming papers (van Leeuwen et al.

ASTRON VO

ASTRON Virtual Observatory

The Virtual Observatory defines a set of standards that can be used to download astronomical data. The ASTRON VO contains several image surveys, which are images in the FITS format. Since the VO is currenty under development, more data types will be available in the future.

Visit ASTRON VO Archives

Zooniverse

Zooniverse Classification Database

The Zooniverse is the world's largest and most popular platform for people-powered research. This research is made possible by volunteers — more than a million people around the world who come together to assist professional researchers. Our goal is to enable research that would not be possible, or practical, otherwise. Zooniverse research results in new discoveries, datasets useful to the wider research community, and many publications.

Visit Zooniverse Archives

Virtual Observatory (VO)

Virtual Observatory (VO)

The Virtual Observatory defines a set of standards that can be used to download astronomical data.

Visit Virtual Observatory (VO) Archives

RUCIO

Rucio

Built on more than a decade of experience, Rucio serves the data needs of modern scientific experiments. Large amounts of data, countless numbers of files, heterogeneous storage systems, globally distributed data centres, monitoring and analytics. All coming together in modular solution to fit your needs.

Visit RUCIO Archives

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Interoperability with IVOA compliant A&A?

The IAM token contains the ISS (issuer field):

“iss”: “https://iam-dem.cnaf.infn.it/”

and an introspection endpoint containing (also) groups information

https://iam-dem.cnaf.infn.it/introspect

curl -H "Content-Type: application/x-www-form-urlencoded" -u

${CLIENT_ID}:${CLIENT_SECRET} -d "token=${ACCESS_TOKEN}"

$ISS/introspect | jq '.'

ISS=https://iam-escape.cloud.cnaf.infn.it

token=my access token obtained loggin-in

CLIENT _ID and _SECRET are ESAP configuration parameters

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