Abstract: ASTRON Science Analysis Platform

Zheng Meyer-Zhao
ASTRON Science Data Centre
Netherlands Institute for
Radio Astronomy
Dwingeloo, The Netherlands
Email: meyer@astron.nl

Yan Grange
ASTRON Science Data Centre
Netherlands Institute for
Radio Astronomy
Dwingeloo, The Netherlands
Email: grange@astron.nl

Michiel van Haarlem
ASTRON Science Data Centre
Netherlands Institute for
Radio Astronomy
Dwingeloo, The Netherlands
Email: haarlem@astron.nl

Abstract—ASTRON (the Netherlands Instititute for Radio Astronomy) is working on establishing a Science Data Centre (SDC) in the coming years. The main driver behind this ambition is the construction of the Square Kilometre Array (SKA), which is the next-generation radio telescope. The SKA will rely on local communities to facilitate the processing of the data coming out of the telescope by scientists. The goal of the SDC is to provide astronomers easy access to astronomical data, compute infrastructure and storage. In order to achieve this goal, we will develop a web-based science analysis platform (SAP), which provides services such as finding data, staging data, processing data, analysing results, and publishing/sharing results, preferably all through a federated single sign-on mechanism, for example, with users' institution identity.

Finding data can be realised by interfacing services provided by the Virtual Observatory (VO) with the SAP. Processing data can be achieved in two ways, namely interactive and batch processing. Interactive data processing requires a flexible compute environment, we will run Jupyter notebook/lab on a virtual machine to realise this. Batch data processing and staging data will require pre-allocated compute/storage/network resources offered by e-infrastructure providers. Authentication and authorisation of all these SAP services need to be handled consistently, for example, through a single sign-on mechanism based on the AARC Blue Print Architecture.

to a limited subset of data obtained by LOFAR, one of the SKA precursor instrument, which is operated by ASTRON. The MVP of the SAP will allow users to query the data, stage the data sets found by this query, and process it on the grid system at SURFsara (the Dutch National e-Infrastructure provider). For authentication, users that have an ASTRON credential will be using their ASTRON institute credentials for all SAP services, other users will be using their own LOFAR and Grid credentials for each individual SAP service.

Keywords—Science Analysis Platform, JupyterLab, Lofar, Grid
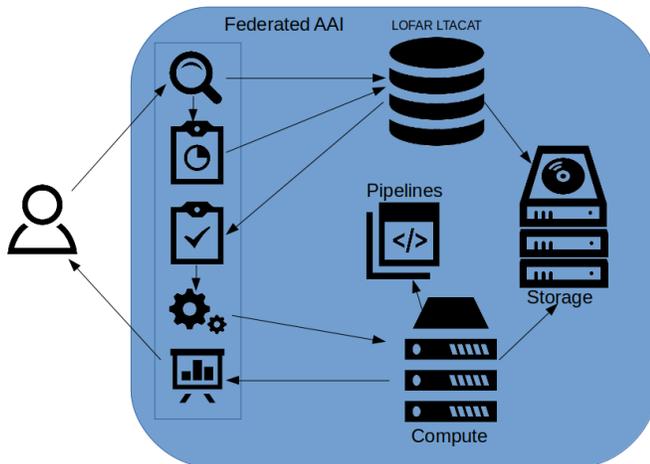
REFERENCES

[1] https://escape2020.eu/

Fig. 1. Science Analysis Platform MVP

We've started the prototyping phase of building the Science Analysis Platform using Django, a high-level Python Web Framework. The plan is to have the minimum viable product (MVP) ready by the end of 2019. Through the MVP we will allow access