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Designing a Federated Regional Centre for SKA Computing

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This paper describes the work done by the AENEAS project to develop a concept and design for a distributed, federated, European SKA Regional Centre (ESRC) to support the compute, storage, and networking that will be required to achieve the scientific goals of the Square Kilometre Array (SKA).

The AENEAS (Advanced European Network of E-infrastructures for Astronomy with the SKA) project is a 3 year initiative funded by the Horizon 2020 program of the European Commission which started in 2017 and includes European, EC e-infrastructure, and Global partners. SKA is similar to LHC and Particle Physics in being a global collaboration of scientists and requiring world wide distributed computing infrastructure to extract the science from the data products produced by the telescopes; however the organisation of the SKA data and the computing required is quite different.

The context will be set by briefly describing the data rates and types produced by the two telescopes that comprise the SKA, followed by an outline of the high-level requirements for the ESRC. Estimates of the scale of the computing and storage provide insight into how one might form a federated distributed compute and storage facility.

The talk will cover the different data placement models that AENEAS has created, in collaboration with the SKA community, and how they influence the design and cost of the global data transfer and access networks that will support SKA.

The talk will show how the computing and storage requirements for the ESRC have been estimated based on use cases and scenarios related to the different types of data products that SKA telescopes will produce. It will also cover how middleware infrastructure such as RUCIO might be used.

The design aspects required to ensure user access to and interaction with the computing infrastructure and SKA data to provide SKA science outputs will be covered. A seamless Authentication and Authorization Infrastructure (AAI) and other federated services are required also for global interoperability.

A set of data challenges have been undertaken by the SKA community and some of these will be presented to conclude the talk.

Consider for promotion

Yes

Primary author: Dr HUGHES-JONES, Richard (GEANT Association)

Presenter: Dr HUGHES-JONES, Richard (GEANT Association)

Session Classification: Track 7 –Facilities, Clouds and Containers

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