SRC | Net

SKAO Regional Centre Network

SRC Network Vision and Principles

SRC-0000005	Revision 01
Classification:	UNRESTRICTED
Document type:	PLN
Date:	2023-08-31
Status:	RELEASED
Authors:	Rosie Bolton, Shari Breen, Antonio Chrysostomou, SKAO Regional Centre Steering Committee

Role	*Name*	*Designation*	*Affiliation*	*Signature*	*Date*
Author	Bolton, Breen, Chrysostomou & SRCSC	SRC Steering Committee and SKAO	SKAO		
Owner	M. van Haarlem	SRC Steering Committee Chair	ASTRON		
Approved	M. van Haarlem	SRC Steering Committee Chair	ASTRON		
Released	L. Ball	SKAO Director of Operations	SKAO		

TABLE OF CONTENTS

LIST OF ABBREVIATIONS

AA	Array Assembly
AAI	Authentication & Authorisation Interface
ADP	Advanced Data Product
API	Application Programming Interface
ART	Agile Release Train
FTE	Full-time Equivalent
HPC	High-performance computing
ODP	Observatory Data Product
PFLOPS	Peta Floating-Point Operations Per Second
SDP	SKA Data Processor
SKA	Square Kilometre Array
SKAO	SKA Observatory
SRC	SKA Regional Centre
SRCNet	SKA Regional Centre Network

1 Introduction

1.1 Purpose of the document

The SKA Regional Centre Network (SRCNet) will be established to provide compute resources for the SKA science community to access and process their SKA data. Furthermore, a science archive will be made available through the Network to enable the global scientific community to engage with public SKA data. This document provides the vision and operating principles for the collaborative network of SKA Regional Centres (SRCs).

The Vision statement and the Principles are presented in this document to inform and guide the development leading towards the first prototype SRC Network, as well as the operations of that Network.

2 Vision for the SRC Network

The Vision statement for the SRC Network is:

> We will develop and deploy a collaborative and federated network of SKA Regional Centres, globally distributed across SKA partner countries, to host the SKA Science Archive. The SRC Network will make data storage, processing and collaboration spaces available, while supporting and training the community, to maximise the scientific productivity and impact of the SKA.
>
> Initially, we will do this by:
> - developing a scalable, prototype SRC Network that allows authorised users and teams to access and analyse SKA data;
> - developing the software, architecture, policies and processes necessary for SRC Network operations;
> - growing the prototype SRC Network, as new SRCs become available and expanded or new functionalities are developed, leading towards a fully operational and global Network.

This long-term vision will be presented at planning meetings for the SAFe teams developing SRCNet software, providing context for the initial focus on the development of the first prototype of the Network.

3 Principles of the SRC Network

The principles presented here apply to the core functionalities of the SRC Network as a whole, necessary for the delivery of an end to end system resulting in scientifically impactful results from users of SKA data. They are not intended to apply to additional capabilities that individual institutions that host an SRC may choose to provide.

3.1 Operational Principles

The following are a set of high-level operational principles for the SRC Network.

P1	The SRC Network will be the only point of access to SKA data for the user community. *Data will flow from the SKA telescopes into the SRC Network. There is no direct access to the SKAO computer systems from outside the SKAO.*
P2	The SRC Network will be available to its users 24 hrs a day /7 days per week. *The SRC Network federating resources will be designed, implemented and managed to be highly reliable and to maximise the uptime and availability of the Network to the user community. The non-availability of individual SRC nodes will not render the Network as a whole unavailable - services will still be accessible by the community*
P3	There will be a common SKAO/SRC Network user account that allows users access to SRC Network resources. *The same account that users of the SKA will use to access SKAO resources (e.g. proposal preparation tools, Helpdesk) will provide authorised access to SRCNet resources.*
P4	SRC Network Operations will be supported in a distributed fashion and coordinated by a single body, the SRC Operations Group. *The SRC Operations Group (SOG) will coordinate the operational support for the SRC Network. The SOG will be distributed across the SRC Network but coordinated from the SKAO. The SOG will not have a role to play in local operations that pertain to the maintenance and operation of local data centres.*
P5	There will be one Helpdesk system for users of the SRC Network and the SKAO. *The Helpdesk will be the cornerstone of the SKAO and SRC Network user support model, providing end-to-end support to users on topics from proposal preparation through to the access to and processing of SKA data in the SRC Network.*
P6	English will be the primary language of communication across the SRC Network.

	All documentation and user support materials will be written in and communicated in English. Translations to local languages are welcome, and should be organised by the respective local SRC. *All Helpdesk tickets submitted and responded to on the SRC Network will be written in English.*

3.2 Sustainability and Environmental Principles

The following principles describe the SRC Network's commitment to undertake sustainable practices in its operations.

P7	The SRC Network will aim to operate in an environmentally responsible manner, limiting its carbon footprint. *The SRC Network will track and report its use of resources and energy at each contributing node. Each will be encouraged to utilise energy resources from environmentally responsible providers and, where possible, the fraction of reusable energy will be reported.*
P8	The SRC Network will optimise its energy usage whilst meeting the scientific goals of projects carried out in the SRC Network. *The SRC Network will aim to optimise its energy usage when selecting the most suitable nodes on which to run workflows. In addition, users will be supported to write energy efficient code, tailored to the specific energy characteristics of the hardware on which the code is running. The SRC Network will optimally locate project-specific data to minimise energy consumption.*

3.3 Security Principles

P9	Security of the SRC Network is a joint responsibility of the participating SRCs, and is managed by the SRC Operations Group. *This differentiates between the security of the SRC Network and the security of individual nodes in that network. The latter is the responsibility of the hosting data centres. In some cases, the security policies of the host data centre may override those of the SRC Network.*

3.4 Fairness, Equity and Inclusion

P10	The SRC Network will lead with principles of fairness, equity and inclusion in all of its activities, and seek diversity of staff. *All users of the SRC Network will experience the same quality of service across the entire network, without bias to any particular group. While the SRC Network will quite likely be heterogeneous, the Network will seek to celebrate and capitalise on that diversity in order to build a better SRC Network*.
P11	The SRC Network will adopt and uphold a Code of Conduct in its interactions with staff and users alike. *The SKA code of conduct (SKAO-GOV-0000135) will be adopted and apply to all interactions and communications, inclusive of SRC Network staff, SKAO staff, and the user community*.

3.5 User-facing Principles

P12	There will be a single Acceptable Use Policy (AUP) for access to resources of the Network. *The single, shared AUP, would cover all of the pledged compute resources across the SRC Network.*
P13	The SRC Network will be committed to providing, and abiding to, accessible and equitable tools, practices and processes. *Accessibility and use of tools, and SRCNet practices and processes will be based on fairness and be unbiased towards any particular group. This is especially important for user-facing tools provided or hosted by the SRC Network. This principle should be embodied within an Accessibility Policy*.
P14	The SRC Network will provide workflow templates to carry out basic and standard processing tasks. *This will lower the bar for non-expert users to come to the SRC Network to access and use SKA data for their scientific research*.

3.6 Compute Principles

P15	The SRC Network will embrace FAIR (Findable, Accessible, Interoperable, Reusable) and Open Science principles whenever possible and appropriate. *Users will be encouraged, and supported, to include basic provenance and metadata information to abide by this principle. This will apply not just to Advanced Data Products (ADPs), but also to the workflows and data collections that generated those ADPs.*
P16	Resources pledged into the SRC Network will enter, and be allocated from, a global federated pool. *There will be a policy to describe how resources are pledged and enter into the SRC Network. The physical allocation of those resources to projects that request them will be centrally managed by the SRC Operations Group (following other principles outlined in this document).*
P17	Network resources will be allocated to projects or teams rather than to individuals or groups constrained by country, institution of other affiliation. *Storage and processing resources will be allocated to projects and not to individual users. The use of those resources by the project team will be the responsibility of the project PI(s). This applies to all projects, whether they are SKA observing projects, or archival (public data) projects.*

3.7 Data Storage and Archive

P18	The physical location of SKA data products within the SRC Network will be determined to optimise access and minimise data redistribution within the Network. *The efficiency of the SRC Network will be improved if data redistribution is minimal (or zero) in order to execute processing jobs for science projects. Individual SRC nodes will not be able to choose which data products they host in their pledged resources.*
P19	SKA Observatory Data Products (ODPs) will be pushed from the SKAO into the SRC Network. *SKA ODP ingest into the SRC Network will be managed by the SOG. Data will be delivered to individual nodes within the Network and optimised for cost and efficiency. SRC nodes will receive data at the maximum rate that they can be transferred into that node from the SKA telescopes.*

P20	The lifecycle of science data products will be managed by the SRC Operations Group. *There will be a policy to determine when science data products should be moved to high-latency data storage devices rather than remain active in the SRC Network. For instance, this could be informed by the "popularity" of those data products, ie. how often they have been accessed over a period of time.*

3.8 Data Processing

P21	Data processed within the SRC Network will automatically propagate all metadata and provenance information in support of FAIR principles. *There will be a data policy to specify required metadata and provenance information, and the auto-population of metadata within workflow processing.*

DOCUMENT HISTORY

Revision	Date Of Issue	Engineering Change Number	Comments
A	2023-08-03	N/A	Draft presented to SRCSC for comment.
1	2023-08-31	N/A	Released version, incorporating comments from SRCSC and SKAO

DOCUMENT SOFTWARE

	Package	Version	Filename
Word processor	MS Word	Office 365	SKAO-TEL-0000000-01B_GenDocTemp_Unclassified_EmptyTemplate.docx
Block diagrams			
Other			

ORGANISATION DETAILS

Name	SKA Observatory
Registered Address	Jodrell Bank Lower Withington Macclesfield Cheshire, SK11 9FT, UK
Fax	+44 (0)161 306 9600
Website	www.skao.int