NICIS – DIRISA Data Intensive Research Support

A national initiative of the Department of Science and Technology and implemented by the CSIR.

science & technology
Department:
Science and Technology
REPUBLIC OF SOUTH AFRICA

CSIR
our future through science

April 2020

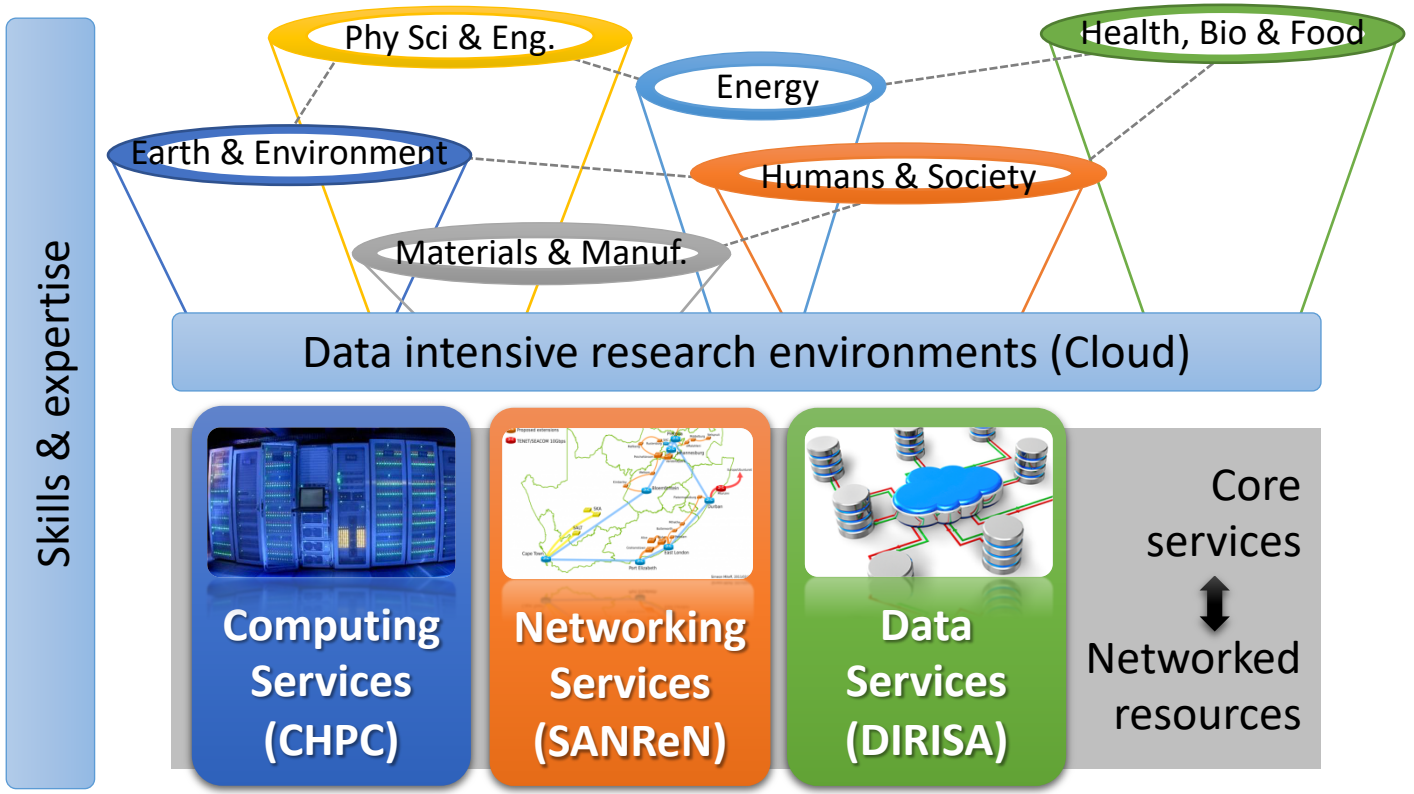
Transboundary Water Collaboration

NICIS Strategic Objectives

- Sustain a world class and relevant national integrated cyberinfrastructure system for Science and Technology
- Enable and promote eScience in South Africa
- Position South Africa to take part in, host and lead large scale global research and science projects (e.g. SKA, CERN experiments, etc.).
- Provide thought leadership to South Africa's evolving cyberinfrastructure strategy and activities, and facilitate uptake of cyberinfrastructure.
- Foster the development of human capacity in cyberinfrastructure and its application, and contribute to the transformation of this sector.

The National Integrated Cyberinfrastructure System (NICIS)

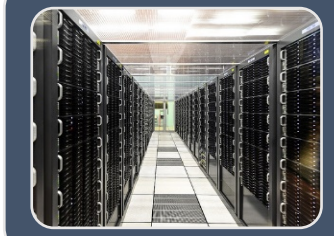
- Federated physically distributed cyber platform for e-research
- Overarching coordination supporting national strategy
  - **National (Tier1)**
  - Regional (Tier2)
  - Institutional (Tier3)
- Priority & cross-cutting domains



DIRISA Objectives

Advocate and coordinate

- Coordinate initiatives
- Stakeholder engagement



Build data infrastructure

- Build and maintain Tier 1 nodes and services
- Start T2 domain nodes

nicis

NATIONAL INTEGRATED CYBER INFRASTRUCTURE SYSTEM

DIRISA

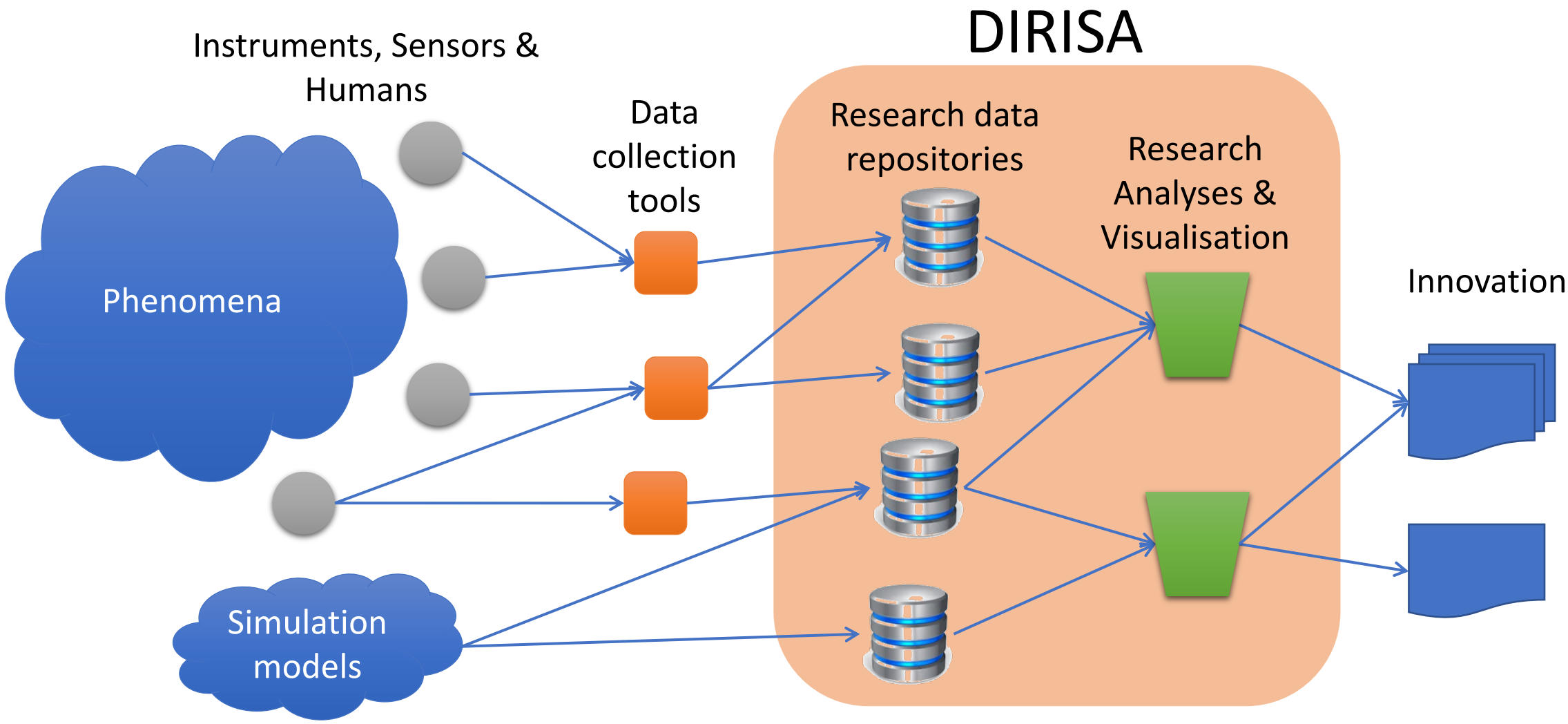
Manage research data

- Deploy RDM services
- Develop user policies

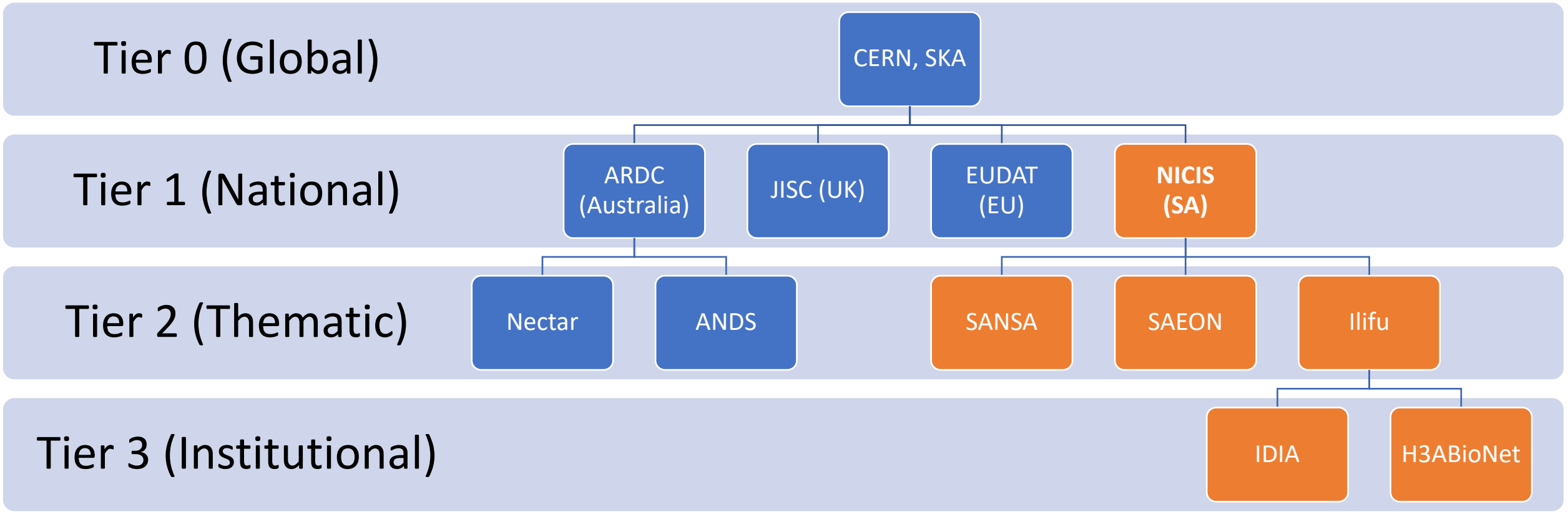
Develop capacity and skills

- Support e-Research programmes
- Coordinate training workshops

Services for the Research Data Value Chain

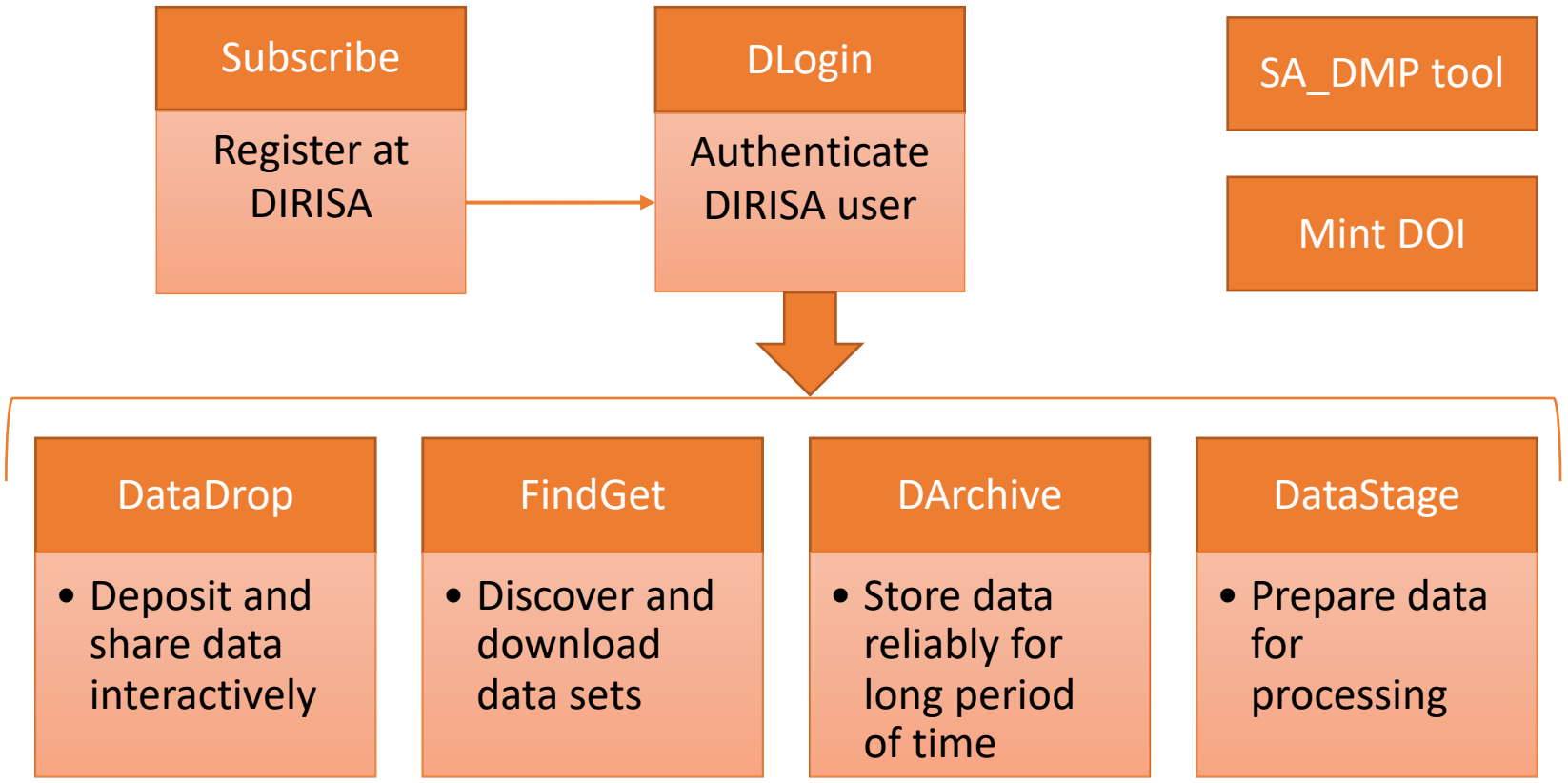


South African National Research Data Commons



South African National Research Data Commons

Phase 1: Research Data Management



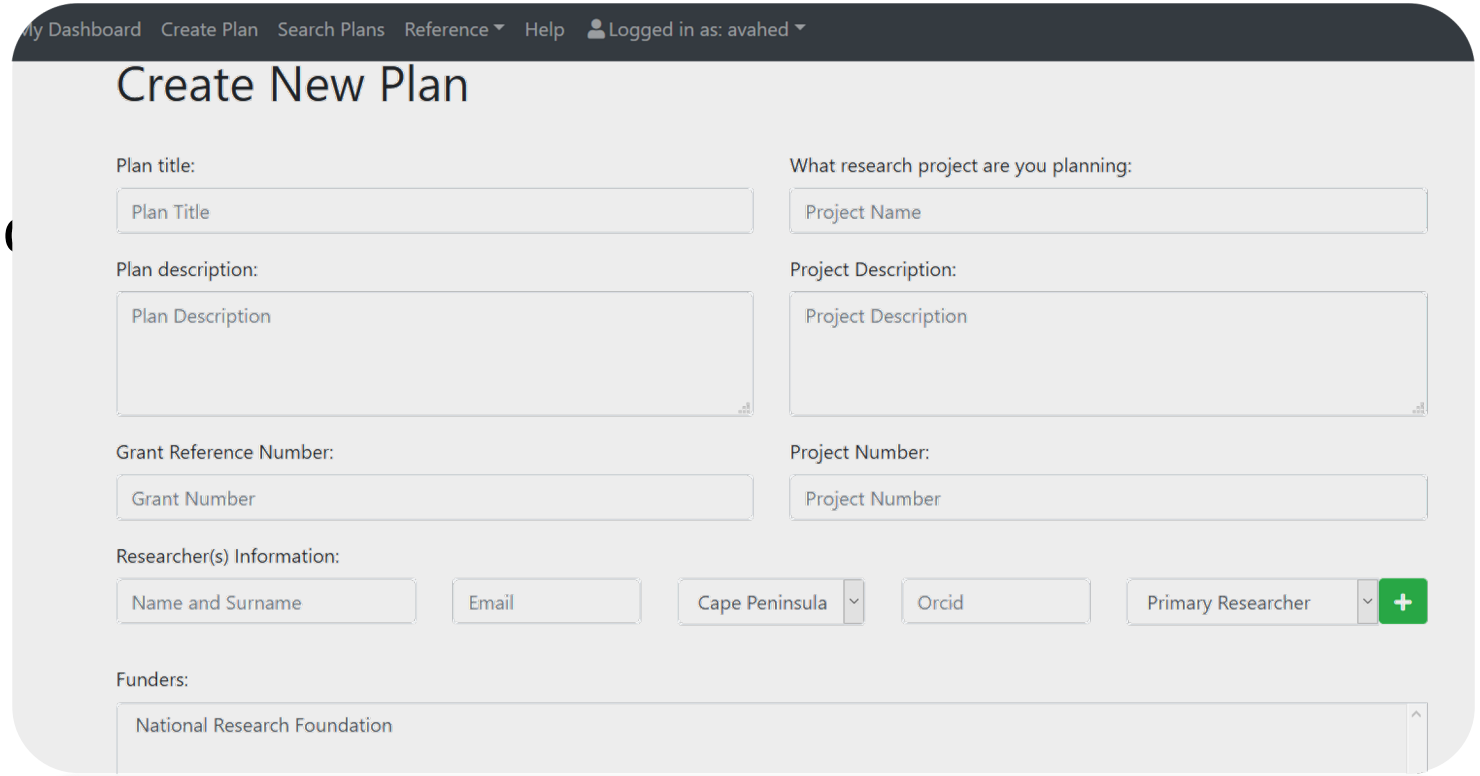
Phase 2: Collaborative Research Environments

My data management plans
My workflows
My data sets and outputs
My communities

Data Management Planning: SA_DMP Tool

Create data management plans: https://secure.dirisa.ac.za/SADMPTool/

- Funder requirements
- Data quality and preservati
- Visibility and discovery
- Asset management
- Publication provenance
- Attribution: citable data

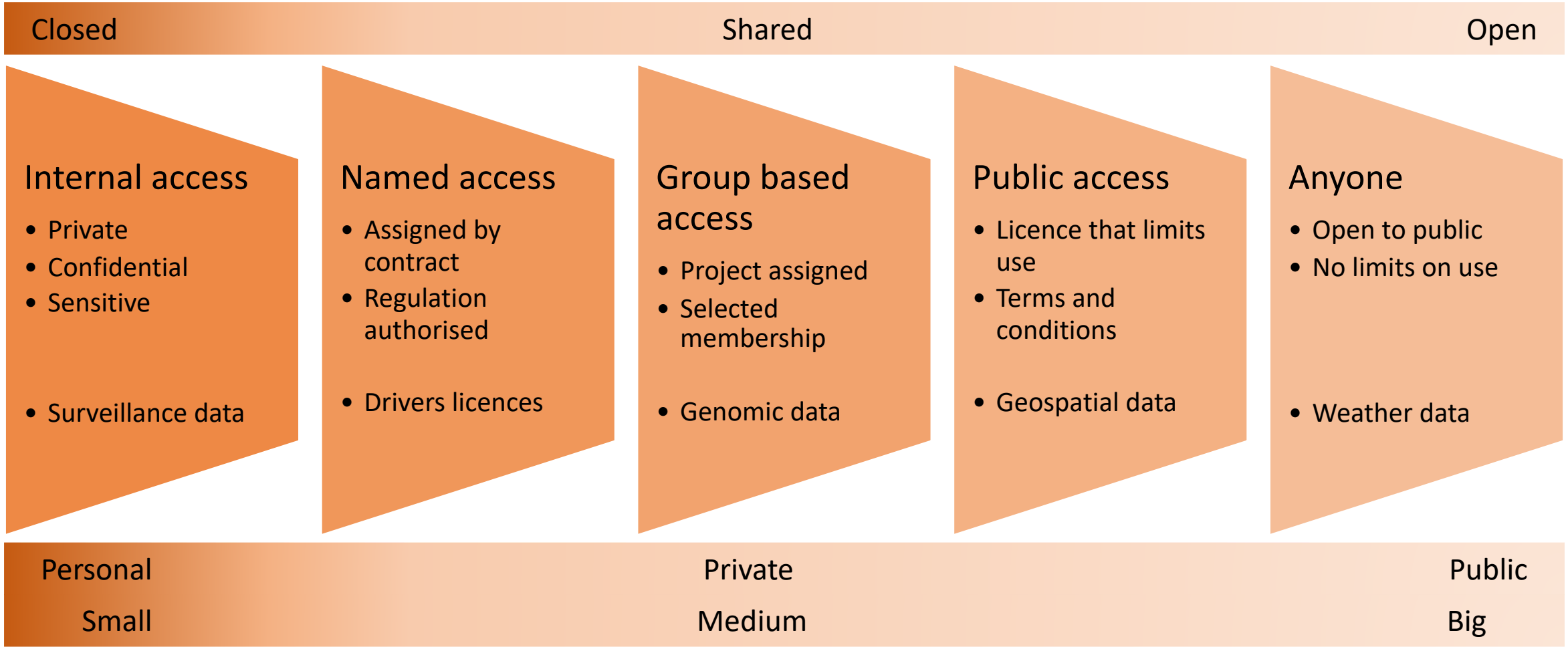


Models of service

- Data storage as a service
  - Registered user has 20GB (default) cloud storage for online interactive access
  - User determines data sharing model
- Infrastructure as a service
  - User has access to a virtual research environment (VM, Docker, Jupyter notebook…)
  - User arrangements
- Data archiving as a service
  - Research data with metadata uploaded to DIRISA long-term (5 – 10 yrs) archival storage facility
  - CHPC archived data outputs

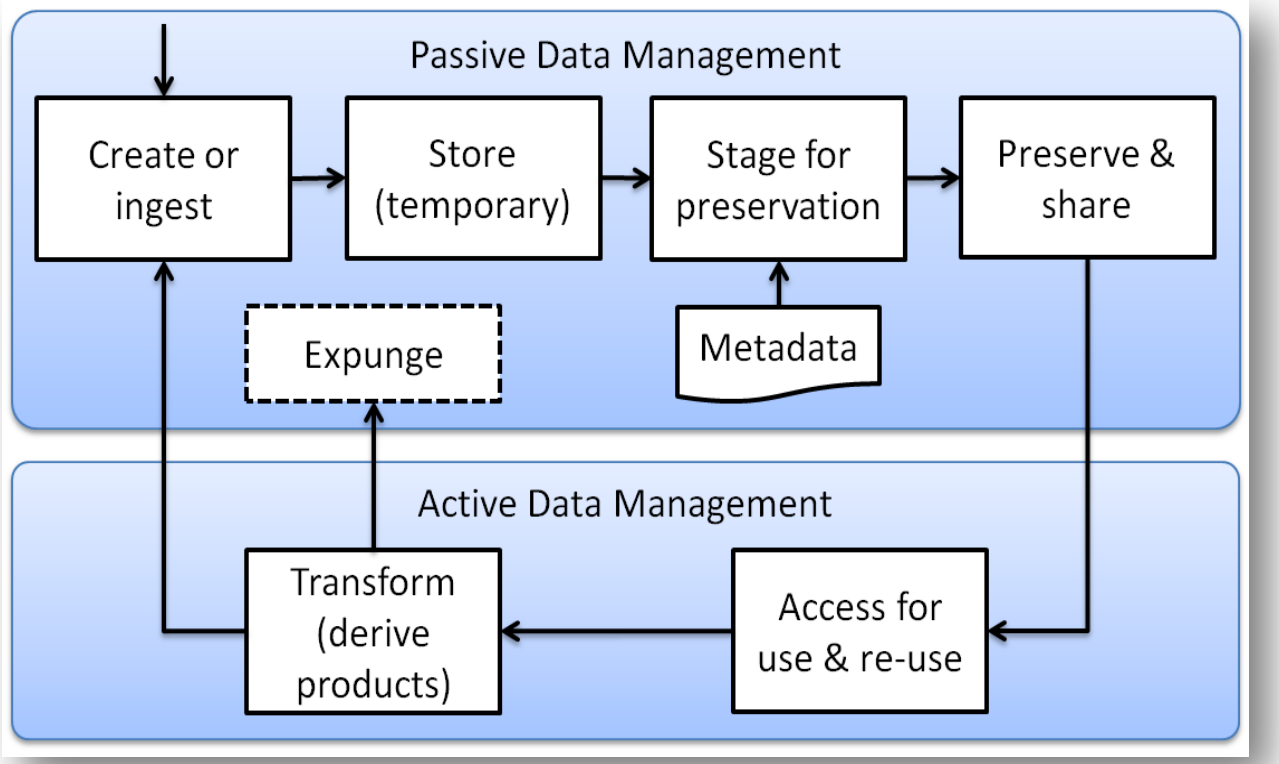
Data Access Model: Open by Default

“As open as possible; as closed as necessary”

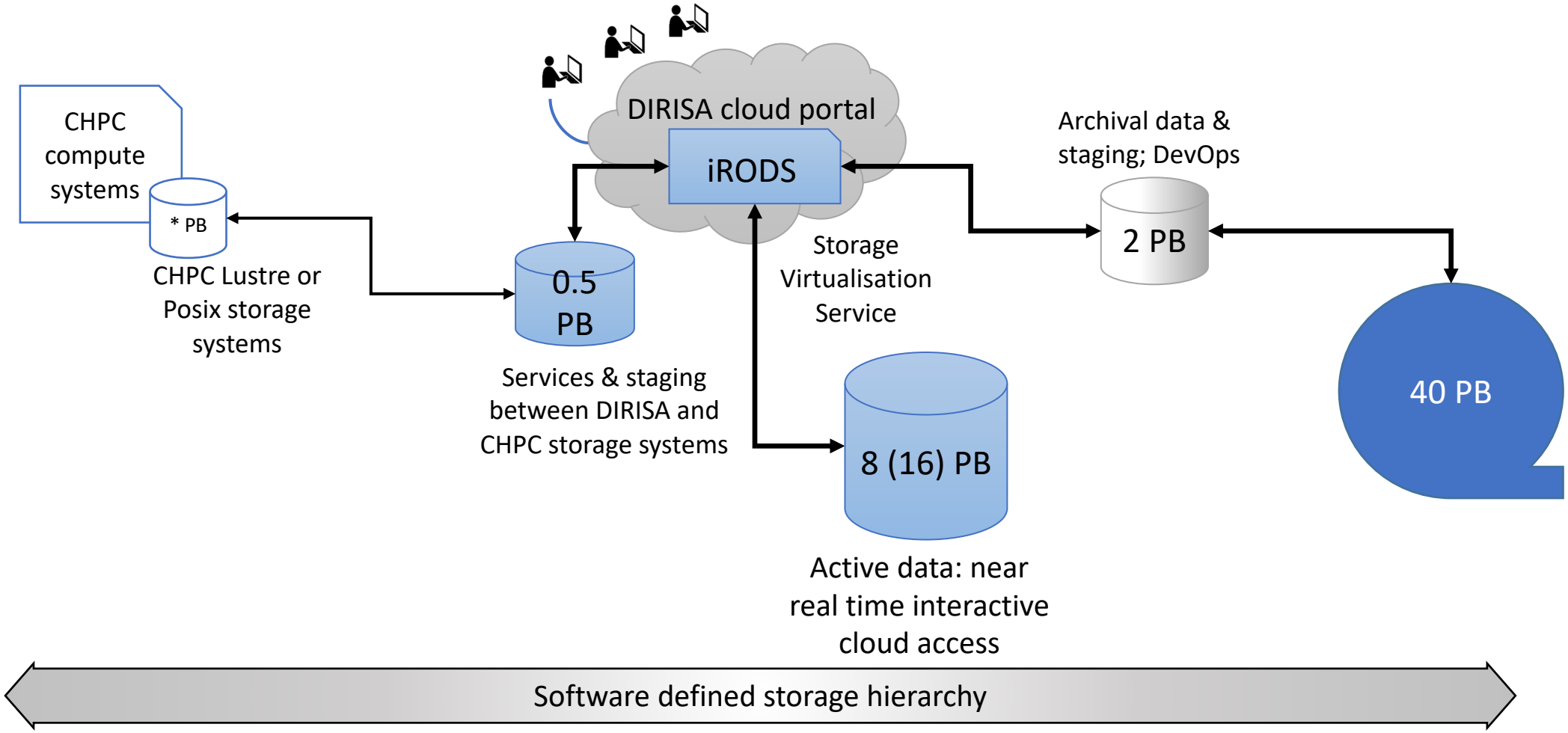


Activities

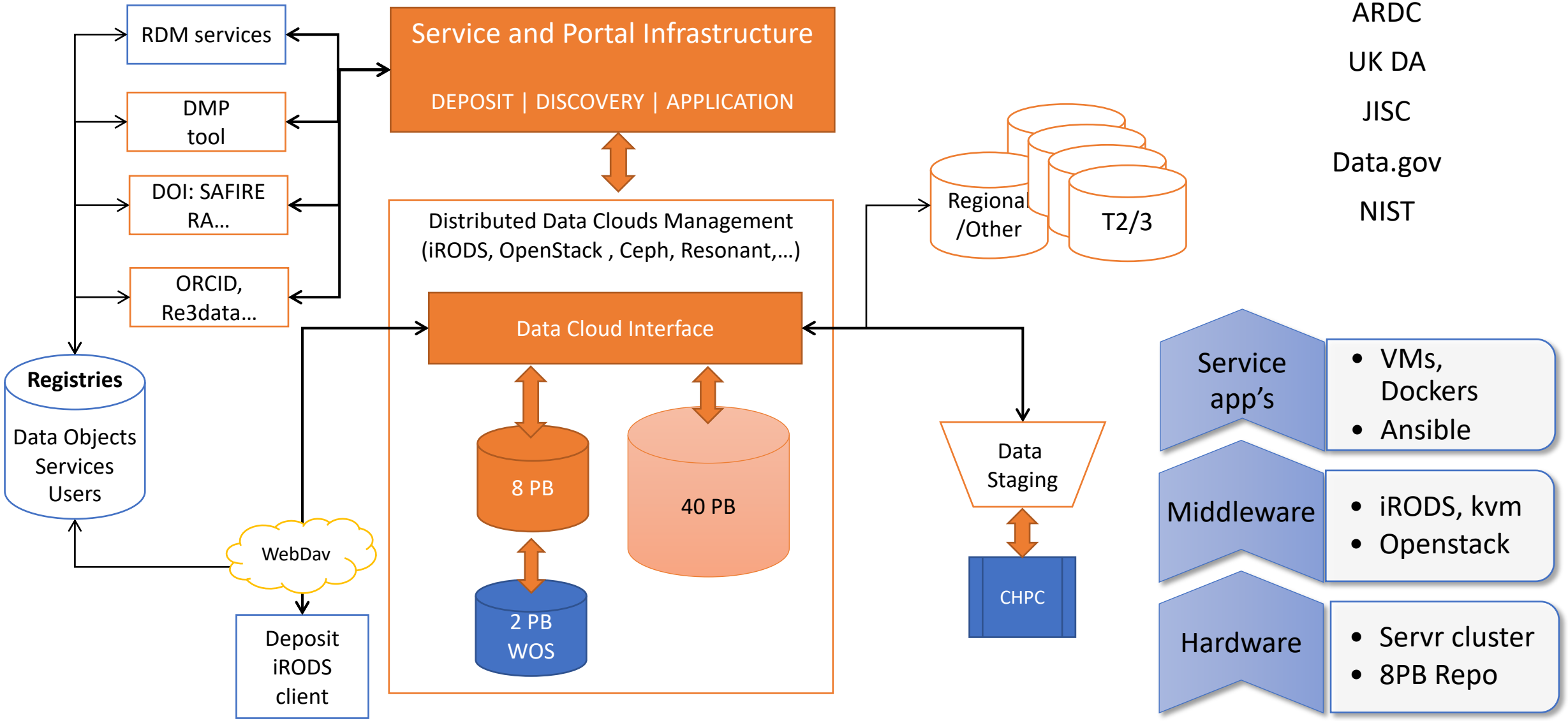
- Data Infrastructure and services (federated data commons)
  - Online (“Hot”) 8 PB & Archival 40 PB (“Cold”) repositories
  - Cloud-based access, upload and discovery services
- Research Data Management
  - Policies: Security & Regulation (POPIA)
- Capacity & expertise
  - Masters in eScience
  - Coordinating training
- Advocacy & outreach
  - Local: DSI, DTPS, USAf, ASSAF, NRF
  - Global: RDA, DCC, CODATA, WDS, SKA
- Coordination & strategy
  - National Big Data strategy
  - AOSP; SADC Cyberinfrastructure



Tier 1 Conceptual Architecture



High Level Architecture



Exemplars

EUDAT

ARDC

UK DA

JISC

Data.gov

NIST

Conclusion: what is needed?

- Data repository
  - Volume/s and growth (Data sets)?
  - Access (Security)?
  - Latency (Bandwidth)?
  - Storage period?
- Analytical environment/s
  - Analytical tools?
  - Services hosting (Web, REST, Databases)?
  - Access (Group/s)?
  - Compute requirements?
  - In-memory (RAM) requirements?

DIRISA does not have domain expertise

Thank you

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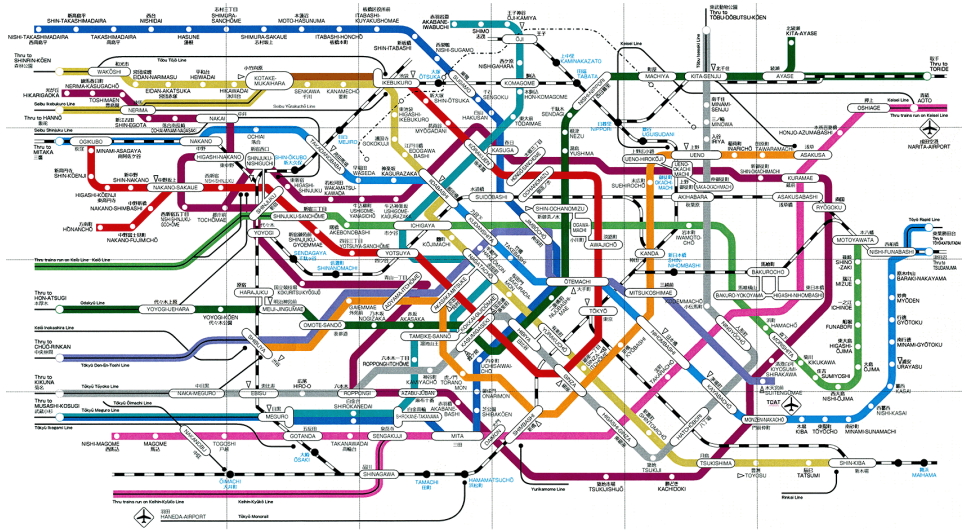
Where are we now?



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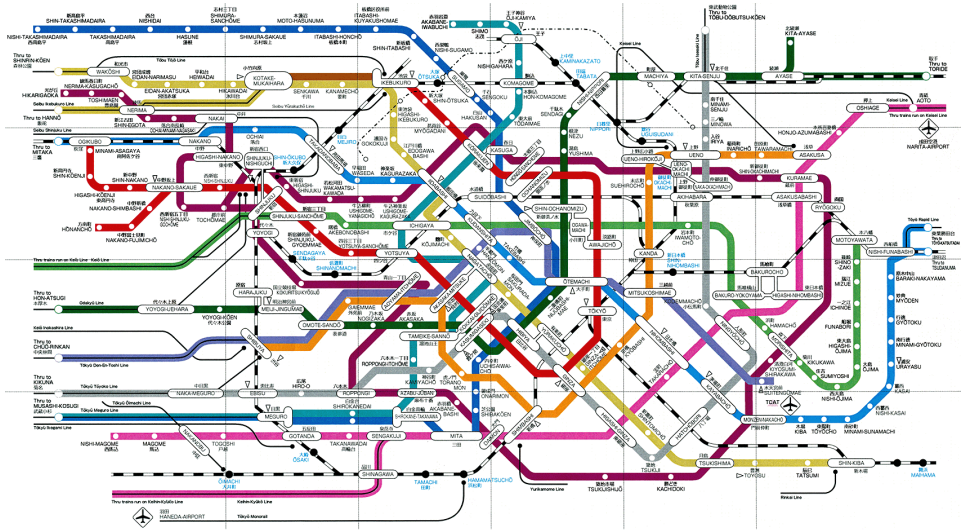


Data Attribution

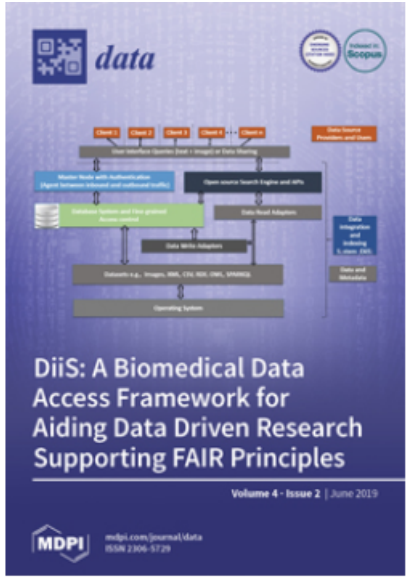
F1000Research
AN OPEN SCIENCE JOURNAL FOR LIFE SCIENTISTS

Journal of
open psychology data

open health data

Journal of
open archaeology data

A peer-reviewed open-access journal
Biodiversity
Data Journal
Making your data count! ISSN 1314-2828 (online)



Data in Brief

Editors-in-Chief: Hao-Ran

> View Editorial Board

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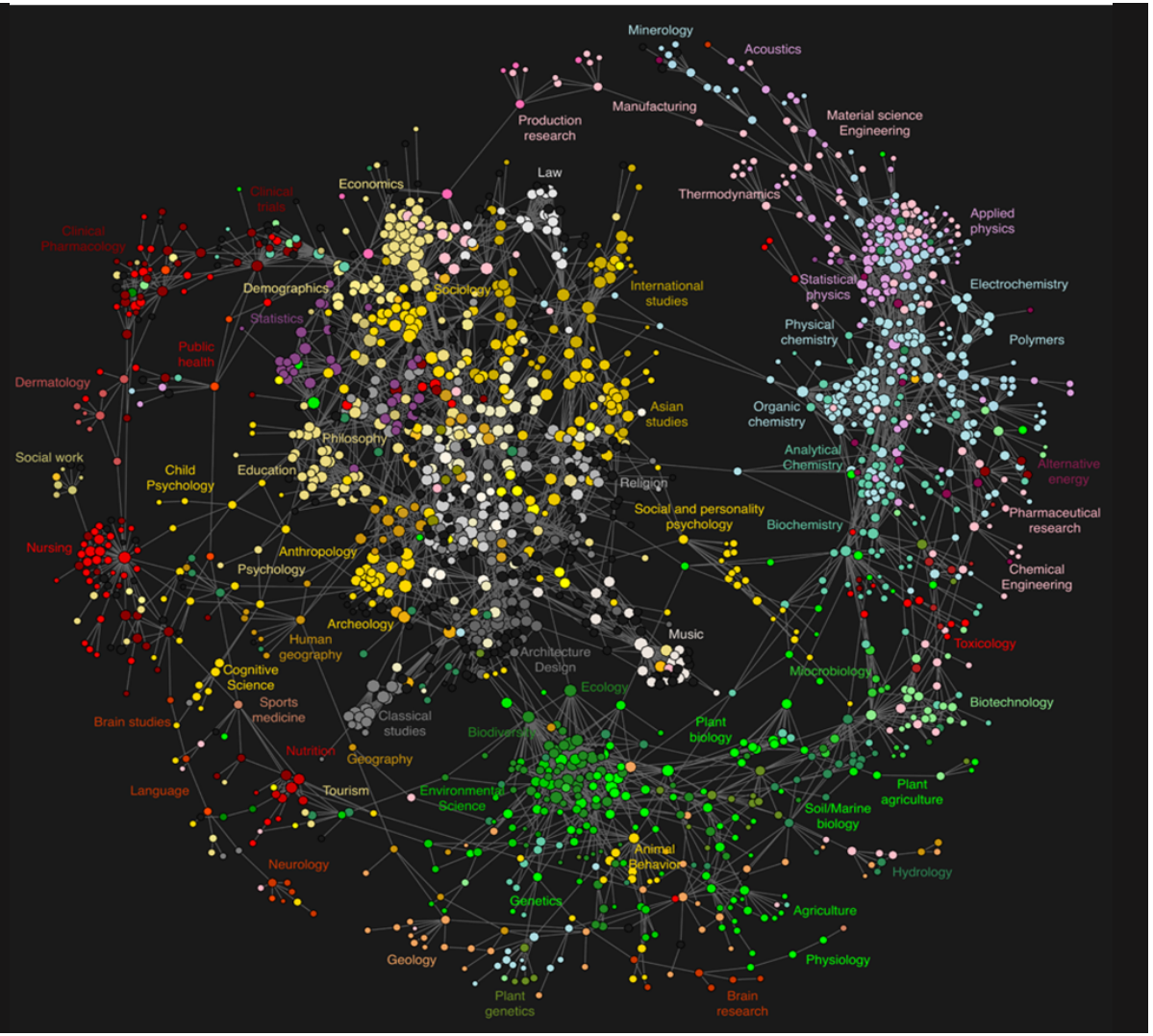
Data Connects Disciplines

- Physical & Chemical Sciences
- Biological Sciences
- Medicine & Health
- Engineering & Manufacturing
- Environmental & Earth Sciences
- Social Sciences & Humanities
- Languages
- Education
- Business & Economics
- Law
- Social media

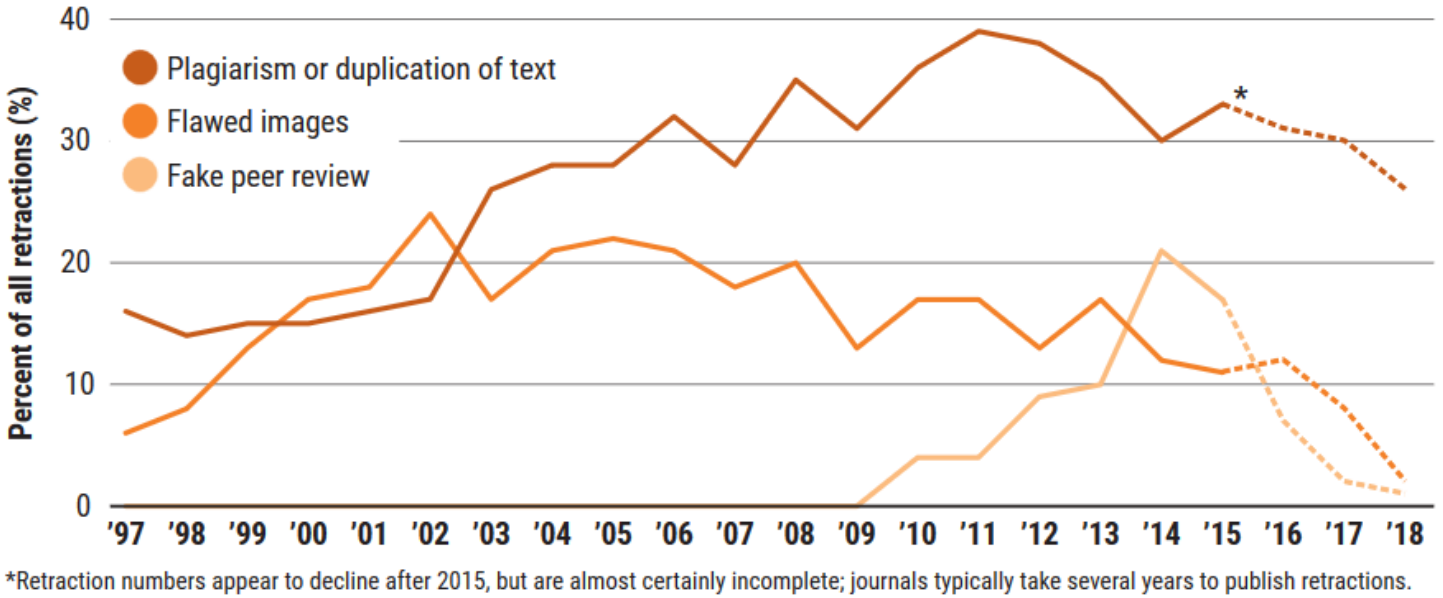


Publication Provenance

Retraction Watch

Tracking retractions as a window into the scientific process

Kyoto University suspends first author of retracted Kumamoto quake paper



*Retraction numbers appear to decline after 2015, but are almost certainly incomplete; journals typically take several years to publish retractions.

nature
International journal of science

Retractions

Retraction | 11 April 2019
Retraction Note: KAT5 tyrosine phosphorylation couples chromatin

Retraction | 20 February 2019
Retraction Note: A homing system targets therapeutic T cells to brain

Improving Return on Data

Skills and expertise

e-Research Environments

Data Management Services

National Data Infrastructure