



Federated

IRIS Digital Research Infrastructure: an update

J. Hays, IRIS Science Director

IRIS Collaboration Meeting

July 2024



iris eInfrastructure for Research and Innovation for STFC

IRIS is a cooperative community
bringing together STFC
computing interests

Formed bottom up by
science communities and
compute providers

Works closely with STFC but
run by the community



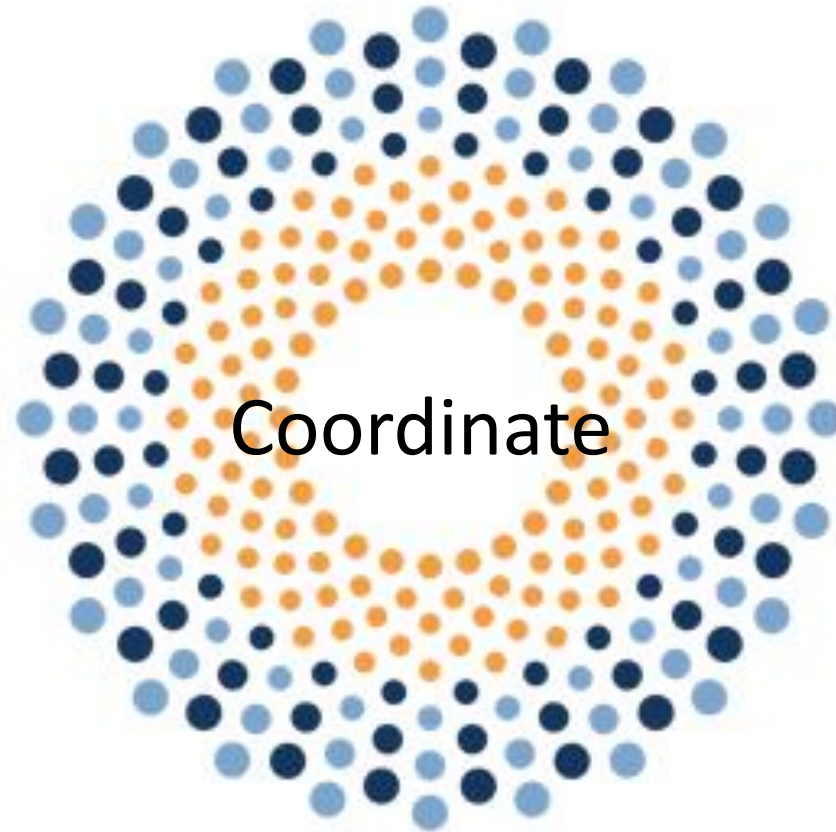


iris IRIS Activities

Build infrastructure

Invest in
computing
hardware

Support digital asset creation



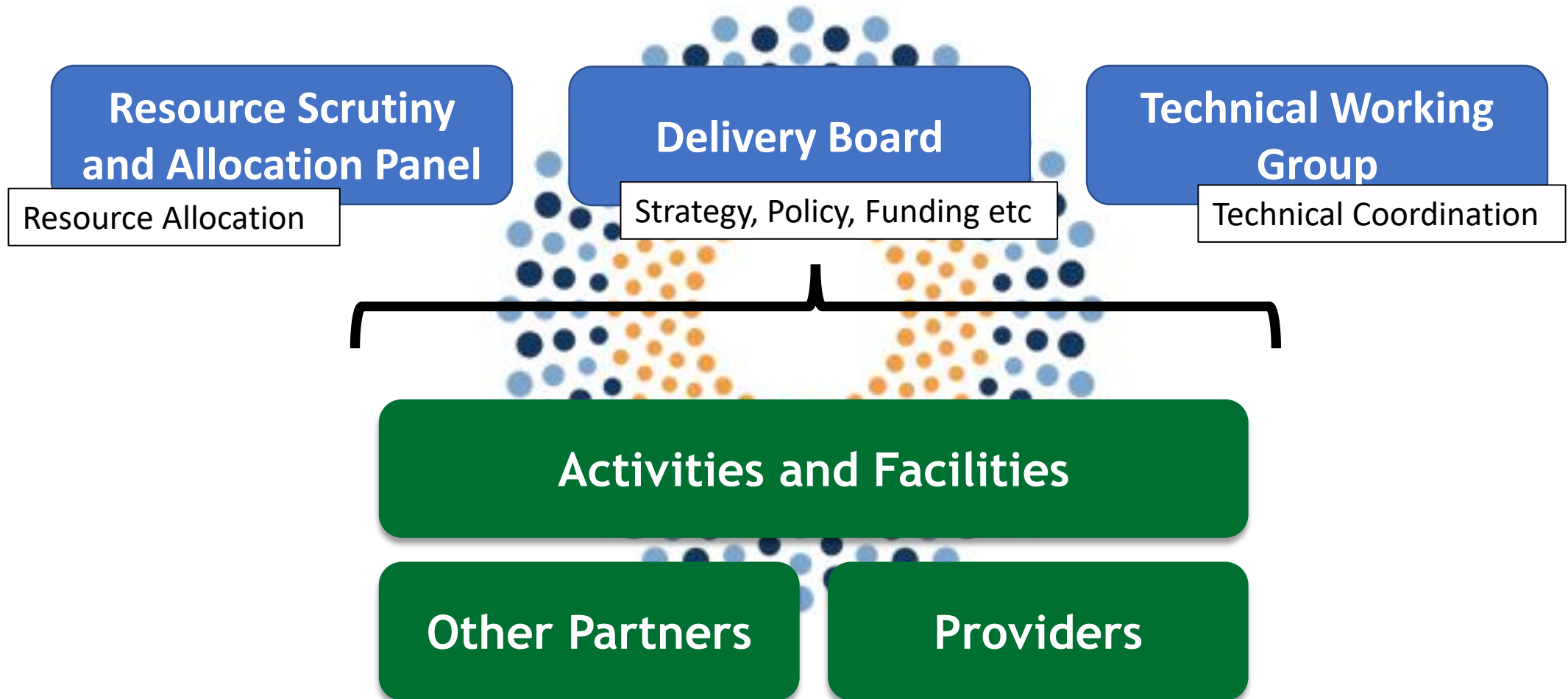
Build community

Support training

Making the case for investment



iris IRIS Structure





iris

Funding

- 2017:
 - £1.5m Capital : £1m hardware, 0.5m digital assets
- 2018:
 - £16m (4M / year over 4 years, 11M Hardware, 5M Digital Assets for National Facilities)
- 2020:
 - Capital injections ~ £6m : 3M capital for IRIS, 2M for LSST (Rubin Observatory), 1M for SKA
- 2021:
 - UKRI Digital Research Infrastructure funding ~ £2m
- 2022:
 - STFC Capital funding £2.4m – anticipated recurrent over 3 years
 - UKRI DRI funding – £3.5m additional funding in 22/23 + 23/24
 - Additional capital supporting Astronomy programme £2.3m
- 2023:
 - STFC Capital funding £2.4m
 - UKRI DRI Phase 1b from 22/23 award - £400k
 - UKRI DRI Phase 2 - £1.4m (£400k 23/24, £1m 24/25)
- 2024:
 - STFC Capital funding £2.4m (?)
 - UKRI DRI Phase 2 - £1m (?)





IRIS and its Community



Technical Working Group

Weekly meetings

Technical discussions – presentations, showcases etc

Operations reports

Regular ad-hoc workshops as and when needed

Wide range of topics from identity management, cloud computing, GPU usage, machine learning etc

Targeted at the IRIS community but open to all



iris

Digital Asset Creation

Digital Assets

Essentially software (or similar) products (capitalizable) – with a defined end point or delivery of the asset



Additional track of funding “Other DA” programme available to full IRIS Community

Often infrastructure related but can also be closer to science

UKRI DRI funding also allows some non-capital projects
- can be used for R&D as well as asset production



Digital Asset Creation



Digital Assets

Identity management - IRIS-IAM

- Working towards single-sign on
- Closely aligned with LSST and SKA work
- Integrated with the DiRAC Federation Project

Radio astronomy on-boarding

- eMERLIN, ALMA, and others
- Documentation, tutorials, community engagement
- Evaluation for IRIS integration

Algorithm Development

- Efficient random numbers on FPGAs
- Support for FAST-HEP toolkit

Data management

- RUCIO (LHC) from development for non LHC usage – multi-VO support, token based authentication support, etc (LSST, DUNE, SKA)
- High performance data transfers for SKA – using FTS and RUCIO (leveraging hardware investment by ExCALIBUR)

Core infrastructure

- Security policy
- Information Security Management – supporting STFC SOC
- Accounting development – building on work at Tier 1
- VMDIRAC – workflow management building on DIRAC (LHCb) for non-LHC
- Tools and services portfolio



iris

What IRIS is not...



IRIS is not a turn-key computing solution

IRIS currently has no direct resource funding for user support – some community support as “best effort”

IRIS can provide physical resources for groups who can make use of it –

Activities may need their own:

- Software frameworks

- Support staff

IRIS might not have the kind of hardware needed for every activity

Future outlook - previously

From December 2023

From January 2023

Established funding line over three years 2022/23 through 24/25

Building stronger links through STFC Programmes to collaborate on DRI delivery for large projects

Though more policy development needed to understand how to establish more solid footing for all our partnerships – science activities, facilities, and providers

Some additional work needed on governance and reporting

Ensure we maintain the autonomy that we have by demonstrating we have good processes, controls, and internal review
Also important for recording and demonstrating benefits realisation to those who make decisions about our funding

Strong participation in UKRI DRI

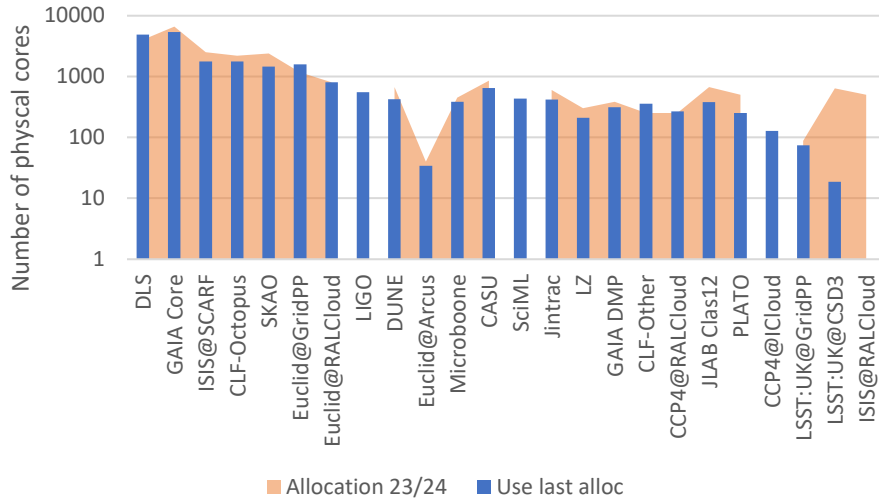
Expect further funding from this direction
Important to recognise the potential for IRIS to be a demonstrator of how to join up disparate projects and facilities into a more coherent whole

Complete our strategy work!

These continue to be key focus areas

Future Outlook: CPU

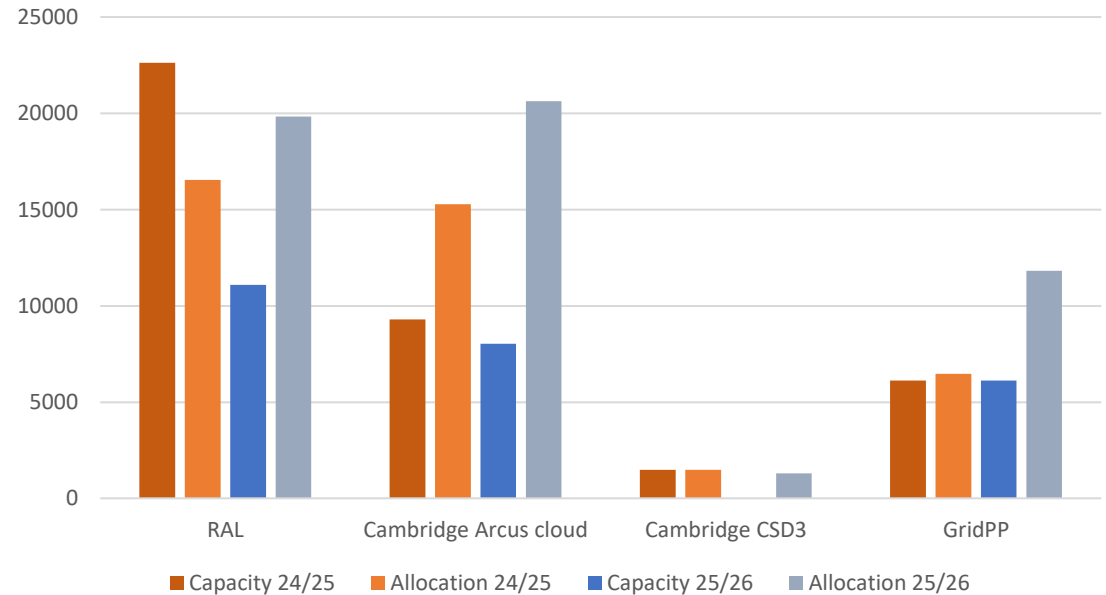
Use vs allocation



25/26:
Under capacity across all sites
(does not include 24/25 procurement)

24/25:
RAL – Spare capacity
Cambridge – under capacity
GridPP – slight under capacity

Capacity vs possible allocation



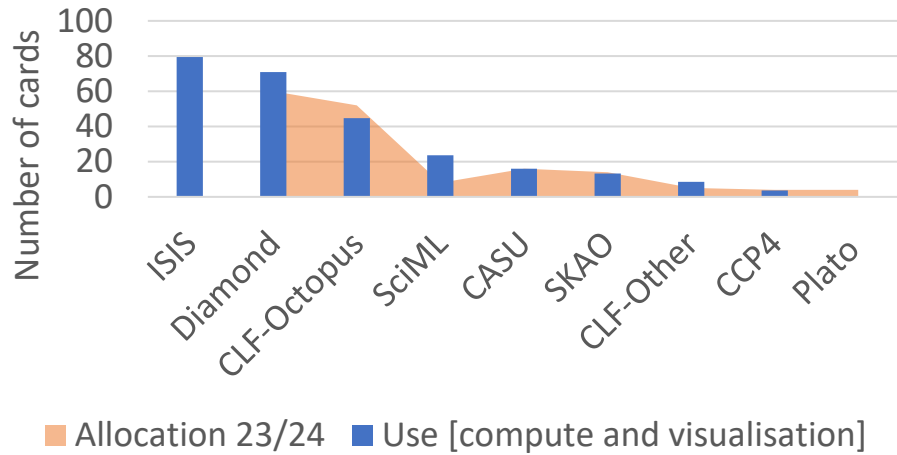
Not shown – refresh needed for Imperial Cloud



iris

Future Outlook: GPU

GPU use vs allocation



25/26:

Under capacity across all sites
(does not include 24/25 procurement)

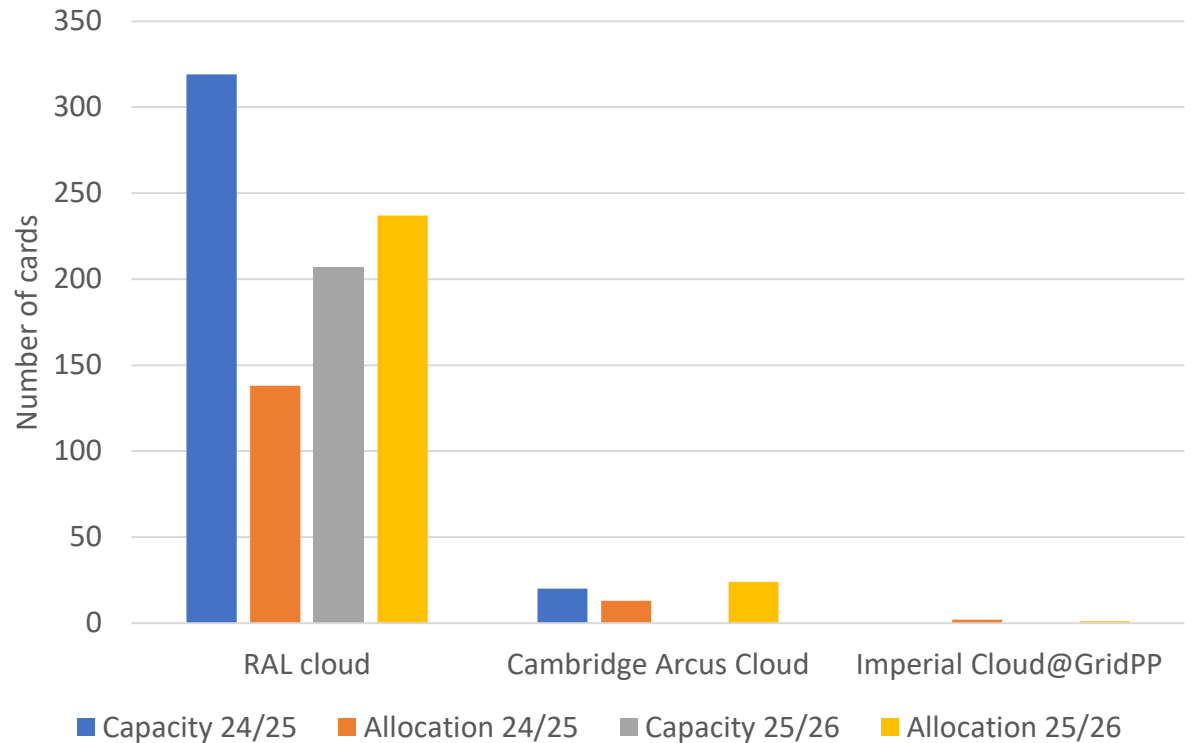
24/25:

RAL – Spare capacity

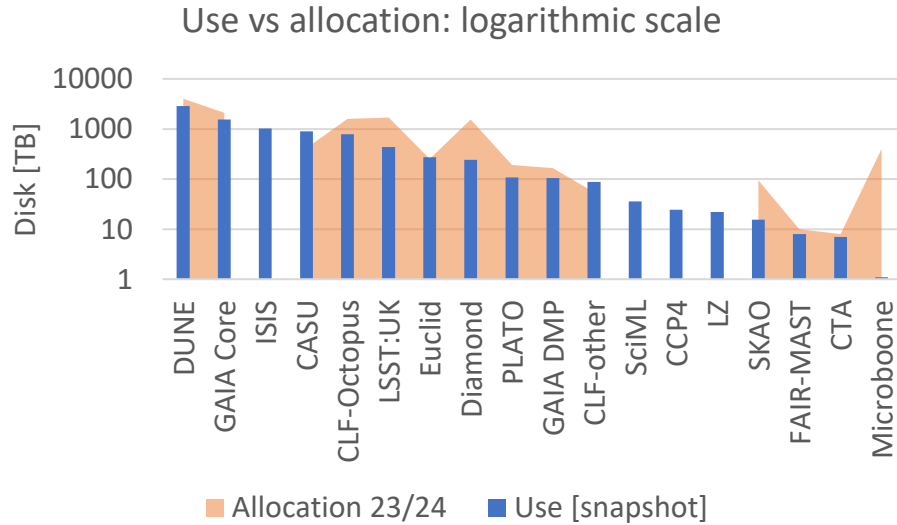
Cambridge – at capacity (excess shared with DiRAC)

GridPP – opportunistic usage

Capacity vs possible allocation



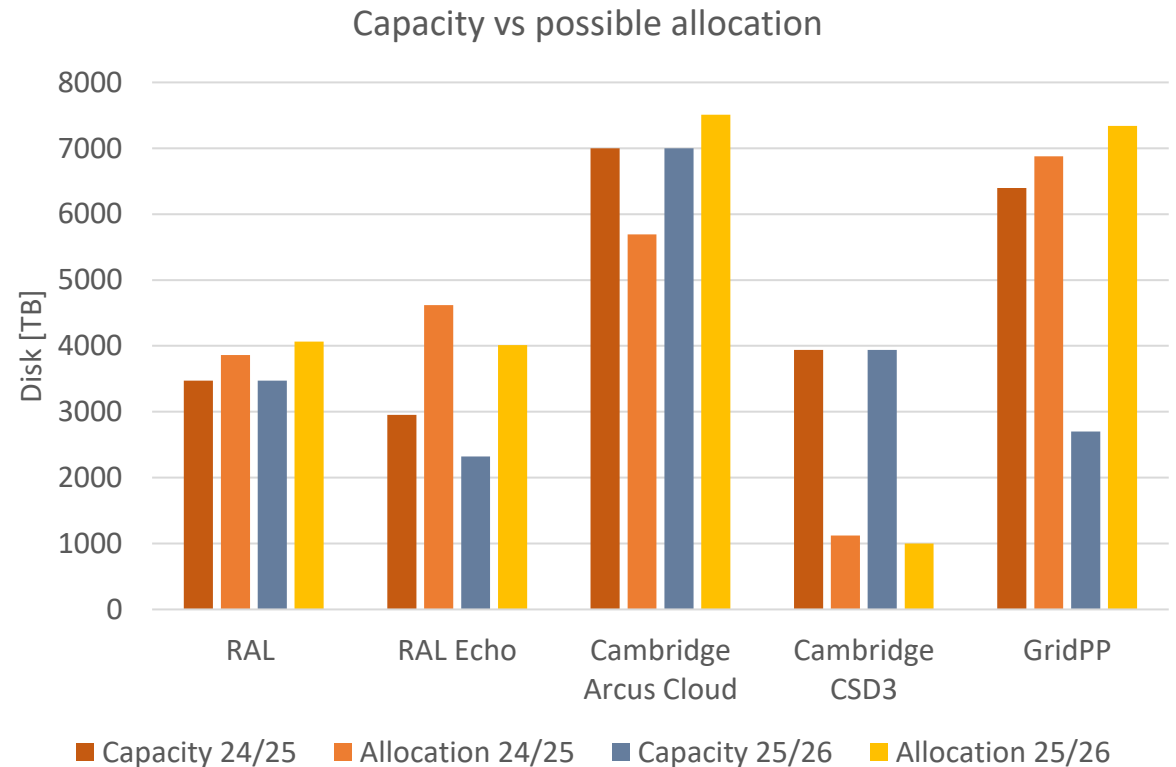
Future Outlook: Storage



25/26:
Under capacity across all sites
(does not include 24/25 procurement)

Not shown – updates needed for Sommerville

24/25:
RAL – under capacity on Echo
Cambridge – under capacity
GridPP – close to capacity





Future outlook

Building on our strategy work – complete delivery plan

Recognised need to establish more sustainable funding model

- sustaining existing capability,

- building new capability in response to science requirements

- develop innovative solutions and approaches

- Joining-up across sites and facilities building out federated services

- Service delivery – services, people, and electricity

Build stronger processes across STFC to ensure joined-up future planning

- Mitigate planning risks

- Right-sizing of projects with respect to funding decisions

- Ensuring cost of compute is appropriately recognised



Future outlook

Building on our strategy work – complete delivery plan

Improved matching between projects and resources

- Enhanced technical review

- Improved job portability

- Benchmarking capabilities

Improved IRIS services, processes, and activities

- Federation services – ensure alignment with other UKRI activities

- Training

- Community

- NetZero



Key Updates

More visibility

Continue to have a session at National Astronomy Meeting
Stand at CIUK-24
Visibility as part of UKRI/STFC at SC24

Training

Key area identified in strategy exercise
Working with DiRAC and SSI on
developing a training plan

Funding opportunity – invited call for
software and skills

Strategy and Forward Planning

Development of delivery plan continues

Paper presented to STFC-EB outlining key issues facing IRIS for a
sustainable future

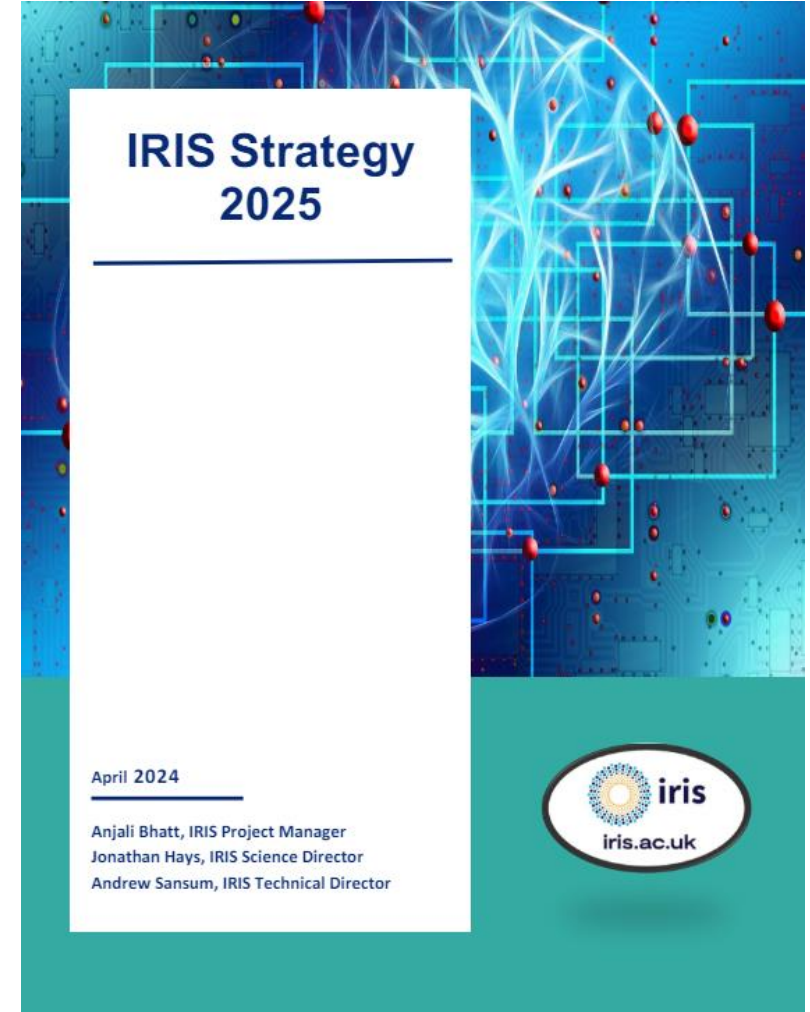
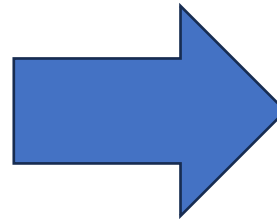
EB noted “IRIS as a huge success”, we anticipate further interaction
later in the year to take the discussion further





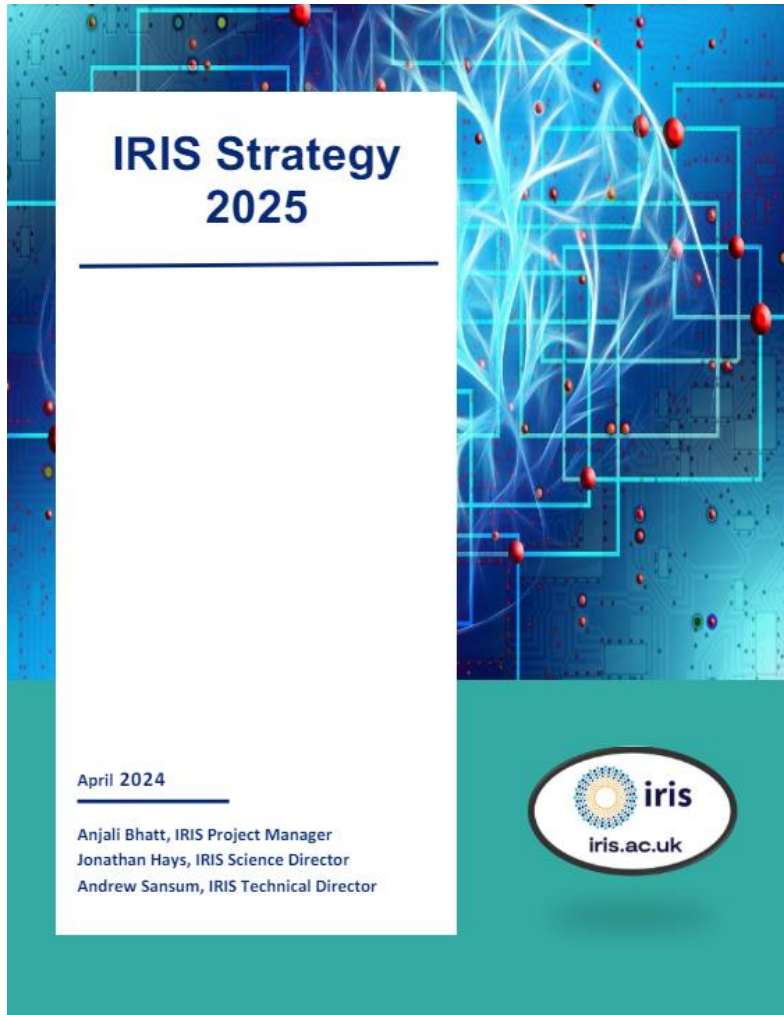
iris Strategy...

| IRIS Strategy | | Domains | | | | |
|---------------|----------------|--|--|--|--|--|
| | | Community & Communications | Skills & Training | Services & Operations | Policy & Governance | Resources / Hardware |
| Themes | Accessibility | How to engage with IRIS, onboarding, RACI Engaging with new communities | Reducing barriers to entry and onboarding | Reducing barriers to entry. UI & Platform provision. E.g. IDAAS, Jupyter User support | RSAP Define user scope of IRIS How to get access and what they can get access to? Engaging with new communities | RSAP Prototyping + seedcorn - hard making systems available for this |
| | Sustainability | Awareness around environment, community longevity, succession planning | Adding value to people and therefore community. Maintaining critical mass of skills and people. | FTE for operations Accounting - driver for efficiency. Understanding efficiency of use and improving | Reporting, modelling future needs, advocacy. Ensure mutually beneficial relationships Be a credible and reliable programme - operation, procurement, financial, project management | Environmental, procurement / vendor management, provider relationship management. Ensure mutually beneficial relationships |
| | Security | Awareness, sharing and security comms plans. Who you gonna call? | Training | Operational security monitoring and incident management | Security Policies - AUP, site policy etc | Ensuring we provide funding for security on top of just boxes. Firewalls, operational monitoring, Being an active partner for site security. |
| | Innovation | Sharing community intelligence. Talks, funding calls, awareness of opportunities Our funding clear on this | Upskilling each other, sounding boards, TWG Knowledge sharing. Sharing community intelligence. Sharing training, and opportunities | Identify needs and develop new services and products to meet those needs. | Process for seedcorn and novel resources. Support innovation through funding decisions. | Prototyping + seedcorn. Onboarding people who are getting there. |
| | Flexibility | Multi-platform - communications routes, JIRA, SLACK Information sharing - website | Training to prepare people for things we *may* want to use. Variety of skills knowing what we MIGHT need to use. Skills to adapt to changing ecosystem and take advantage of other peoples innovation. | Interoperability Joining up Resilience | Get out clauses Policy must support the science Annual review to ensure policy fit for purpose RCI | Having the right mix of hardware to meet needs. Ensure diverse ecosystem to be adaptable to changing needs |

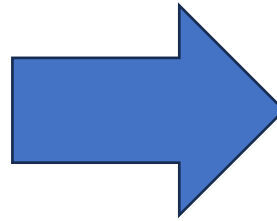




iris Strategy...



Still in development





iris

Summary

IRIS is a cooperative community bringing together STFC (and beyond) computing interests

Bringing groups together
Building Infrastructure
Supporting Science
Lobbying for the future



<https://www.iris.ac.uk/>