

ARDC Data Retention Project

Phase 4: Identifying Important Data Collections

Project Proposal

ARDC Storage and Compute

For Release

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Statement of Intent

“ARDC is a transformational, sector-wide initiative, working with sector, government, and industry partners to build a coherent national and collaborative research data commons. This will deliver a world-leading data advantage, facilitate innovation, foster collaboration and enhance research translation.”

The ARDC aims to design realistic and sustainable national infrastructure and support mechanisms for important research data output. The Data Retention Project was designed to characterise and quantify the research data infrastructure burden supporting research data collections as they emerge from research activity and NCRIS facilities; data collections which may then be retained for future re-use or as part of the scholarly record in accordance with established academic convention and the FAIR data principles.

This project phase (Phase 4: Identifying Important Data Collections) will use a capacity subsidy model to support underpinning infrastructure storage for research data as they emerge from national meritorious research:

- Data output from meritorious research (e.g. funded via competitive grants)
- Data output generated from NCRIS facilities
- Data output emerging from collaborative projects of national importance

This co-investment will subsidise single copy capacity and does not include measures for resilience, backup or redundancy.

In exchange, the project will require two (2) deliverables:

1. A register of estimated data storage capacity from each partner according to a ‘project register’ with foundational metadata on funding, collaborators, participants and disciplines.
2. When investment completes (Dec 2023) a simple audit on actual storage allocation v’s estimated storage allocation, will be returned.

The Data Retention Project together with the ARDC Nectar Research Cloud, underpins a robust and responsive national data commons.

Project Purpose

Identifying Important Data Collections is an additional project phase informed by findings from the ARDC Data Retention Project Phases 1-3 (2020-2023). It is a flexible capital infrastructure co-investment calculated from estimated data storage requirements from eligible organisations undertaking nationally

significant or meritorious research. The project goal is to support a staged option between the current situation where no national metadata standard is consistently implemented and the Data Retention Project phases 1&2, which required a FAIR-enabling standardised metadata of 13 internationally recognised concepts.

A key finding from the Data Retention Project phase 1&2 (2020-2023) was the often underestimated and significant burden in collecting metadata retrospectively; metadata that either had not been created or had not been managed efficiently. This finding suggested there was a further opportunity for the ARDC to support staged data management practices that enabled more efficient progression of research data collections from pre-FAIR activity (in-project, active data management) to more FAIR and reusable data collections (post-project management of data collections at rest).

A key goal of the Data Retention Project is to define and benchmark the operational processes required to store, move and present research data collections in order to design realistic and sustainable models for any future investment in national data infrastructure. The minimal but purposeful metadata requirements do not significantly impact the context, utility or cultural oversight of important data collections.

2022-2023 Initiative: Identifying Important Data Collections (Data Retention Project Phase 4) is a 12 month co-investment partnership with universities and NCRIS facilities. This will extend the project benefits to planned or current meritorious or strategic research projects where research data are unable to be fully FAIR during the research project phase, either because the data are being collected, analysed or otherwise not sharable outside the project group or facility. Partners in this phase will register foundational metadata concerning participants, organisations and relevant information on funding and research grants, in a private registry according to the metadata concepts detailed below. Collecting and registering these critical metadata at commencement removes a common burden of revisiting project details after project closure.

Support will be allocated as a single capital investment front loaded to a 70:30 ratio based on total estimated institutional or facility data storage requirements for all eligible research projects. In providing this investment, the ARDC cannot guarantee future support but expects a proportion of supported capacity will progress to richer descriptions, in line with earlier phases of the Data Retention Project.

Intended Audience

We invite single applications from interested Australian universities and NCRIS capabilities that are responsible for managing large scale infrastructures and/or capacity for in-project data storage requirements. Where a university is a lead host for an NCRIS facility, both the facility and host will be considered independent applications.

Intended Use

Investments are flexible and can be used to support existing or new operational burdens including but not limited to, hardware, capacity or FTE allocation to manage research data in line with the metadata requirements and NCRIS principles. Metadata criteria concern the ownership, funding and affiliation as well as project duration and estimated data storage requirements. We anticipate these metadata will be most accurate and authoritative when recorded at the beginning rather than the end of the research project. Support can be provided to research projects retrospectively up to two (2) years and for a maximum of three (3) years.

Expected Outcome

In collecting national project level data storage requirements via contemporary and authoritative metadata, we expect a clearer picture concerning the transformation of research data output from meritorious and strategic research projects into valuable and reusable research data assets. Further, it is anticipated that by collecting these foundational metadata the pathway to a more FAIR state is enabled for a significant number of identified collections.

Available Investment

The ARDC Storage and Compute theme has an annual budget of \$6 million per annum for three years 2020-2023, \$18 million. The Data Retention Project has been allocated 50% of the total budget, \$9 million in total.

Phase 4 has an investment budget of \$3.0 million and has set a subsidy level of \$100/TB with partners expected to execute contracts in December 2022 with all contracts completing by December 2023.

An expected outcome of the Data Retention Project is a coherent investment cycle that incorporates all phases (1-4) and aligns with NCRIS investment cycles. We envision staged and regular investment opportunities tied to increasing levels of metadata. At its discretion, the ARDC Ltd Board may vary the theme or project allocation.

Co-Investment

ARDC requires 1:1 matching co-investment for all infrastructure partnerships.

Co-investment must be in an auditable form (in accordance with reporting and accountability requirements as specified by the Commonwealth Department of Education) and can be cash (from project partners or other grants), or effort/labour. NOTE: if contributing effort/labour, work ofn the project must be a significant amount of the person's time, e.g. 25% or more.

Benefits

The Data Retention Project Phase 4 investment aims to realise the following benefits to the research sector.

Benefit to Researchers

Researchers will benefit from this Phase 4 investment by more easily fulfilling compliance requirements from major Australian (and international) funders for data management and the preservation of accurate and quality evidence that underpins their research.

Phase 4 investment will establish foundational fulfilment of R22 of the Australian Code for the Responsible Conduct of Research by collecting important and accurate project level metadata and so not require revisiting historic data or long finished research projects.

“Retain clear, accurate, secure and complete records of all research including research data and primary materials. Where possible and appropriate, allow access and reference to these by interested parties¹.”

Benefit to Eligible Organisations

Partners in this call will be Australian universities or NCRIS capabilities that manage research data infrastructure with significant operational overheads to support research data storage needs. This investment will encourage robust, reliable and high-quality data as they emerge from important research investments that can streamline research management for reporting or assessment purposes; for example institutional strategy development or Excellence Research Australia.

Phase 4 investment will help enable institutional fulfilment with R8 of the Australian Code for the Responsible Conduct of Research and establish a foundational metadata standard that captures accurate and contemporary values directly from researchers at the most effective cycle of research projects.

“Provide access to facilities for the safe and secure storage and management of research data, records and primary materials and, where possible and appropriate, allow access and reference¹.”

By collecting these foundational metadata organisations will find it significantly easier to make use of potential future investment via other mechanisms of the ARDC Data Retention model. This investment enables flexible support for sector infrastructure by focusing on content (research data) and allowing investment partners to match them to the most appropriate and cost effective storage capacity.

¹ Australian Code for the Responsible Conduct of Research 2018. National Health and Medical Research Council, Australian Research Council and Universities Australia. Commonwealth of Australia, Canberra

Benefit to the ARDC

The ARDC supports underpinning infrastructure and enables easier adoption of the FAIR data principles as data emerge from active research projects. Lowering barriers and burden to recognise important data collections is facilitated by recording contemporary foundational metadata like persons, organisations and funding references as they emerge into formal data collections, which often require ongoing support as part of the scholarly record or to maximise reuse potential.

Relationship with other ARDC programs and investments

The Data Retention Project supports other ARDC activities by investing in a sustainable data infrastructure capacity and an international metadata specification. This project phase establishes a coherent and consistent view of important data collections across the national research sector as they emerge from meritorious and/or strategic research at eligible organisations, which includes existing ARDC investments in Platforms projects and National Data Assets, Thematic Research Data Commons' and Translational Research Data Challenges. Further, this Phase 4 investment amplifies the impact of existing and developing ARDC services like the DataCite consortium and other identifiers services.

Eligibility

Eligible Organisations

Single applications to support estimated storage capacity for eligible research project data output are invited from NCRIS capabilities and Universities that can demonstrate the principles of NCRIS (see Appendix 1) with regard to the data storage infrastructures they manage; namely they generate and store data output with potential enduring value to the research sector, are national in scope, collaborative in nature or contribute to the wider research infrastructure.

Eligible Research Projects

For the purposes of the ARDC Data Retention Project, 'eligible research projects' are defined as those projects established via meritorious and/or strategic research activity, e.g. via a formal grant funded body or NCRIS facility which involves or is wholly composed of Australian researchers. Data outputs are the digital output of a research project, a national facility or NCRIS capability, or a collaborative effort within an international community, hosted on capacity infrastructures located in Australia.

Each eligible research project should be characterised by a defined period, with a grant number/s or facility allocation code/s. Individuals associated with each eligible project will be characterised with ORCID. All participating institutions will be characterised with Research Organisation Registry IDs (ROR). The project discipline/s will be characterised with at least one (1) ANZRC Fields of Research Codes (FoR).

The goal of this investment is to establish a mechanism to embed a set of criteria ‘at creation’ which help to maximise any future potential as formal data collections.

Support

What we will support

The ARDC will co-invest in capital or operational burdens of data storage capacity as a non-redundant volume subsidy for a 12 month period. Data storage infrastructures can be private, commercial or hybrid services, e.g. via on-premise hardware, cloud, or third-party capacity. Unlike Phases 1 & 2, the data generated are not expected to immediately exist as objects in the scholarly record or a sharable strategic data asset, but are expected to be made as FAIR as possible in a timely manner. As research projects conclude, data can be arranged into more formal collections and presented in a data repository and may then become eligible for further support via the investment model established in the Data Retention Project Phases 1,2 and 3.

Who we will support

This investment does not support research projects directly, rather we support the enterprise operations that facilitate data storage infrastructure to such projects. If a project or collaboration is seeking support for data capacity investment we encourage them to contact their host service provider to consider this investment opportunity as a consolidated service benefit.

This investment will directly support Australian universities and NCRIS facilities undertaking meritorious research or research considered strategic according to NCRIS principles. Capacity will be managed as enterprise infrastructure by an Australian university or NCRIS capability and by considering the whole organisation, represent consolidated research project activity for which economies of scale are expected. In cases where single organisations administer other eligible applicants, for example a university that hosts an NCRIS capability, each application will be considered independent of each other (despite ultimately being administered by a single organisation). In such cases, due diligence will be implemented to minimise the risk of unintended duplication of investment.

How we will support

The mechanism for support will be an ‘estimated capacity’ cost subsidy model implemented as a total registered capacity for all eligible projects. A subsidy will be calculated according to an expected capacity requirement from each organisation and unit subsidy of AUD \$100/TB. Of the total calculated subsidy, 70% will be available on contract execution and the remaining 30% following project closure audit of actual storage capacity allocations.

Support Requirements - Metadata Criteria

Consolidated project data storage capacity requirements will be estimated by applicants and presented in application via a project register (spreadsheet template provided in Appendix 2). Project registers must contain all of the following eight (8) metadata values for each research project to be considered for support. The metadata elements were chosen as the minimum necessary to manage the investment and record important characteristics of data output arising from meritorious research.

ID	Concept	Concept Type	Accepted Values
P41	Project duration	Duration of project, irrespective of whether any data exist at that time	date range: mm yy-mm yy (can be retrospective up to 2 years)
E01	Storage capacity	Estimated capacity requirement for each nominated project	Terabyte-TB (1TB = 10 ¹² bytes)
E03	Applicable research disciplines (all that apply)	ANZRC Fields of Research codes	2, 4 or 6 character ANZRC Fields of research (FoR) codes
E04	Title	A semantically relevant title of the research project or activity	Free text
E05	Description	Abstract style description of the research project or activity where data are collected	Free text
E06	Data Controller/s ² (all that apply)	Data controllers have responsibility for the enterprise data storage facility.	Research Organisation Registration (ROR) and/or ORCID.
V03	Owner/s Contributors (all that apply)	Individual or organisational ownership declaration plus others involved	ORCID for individuals, ROR for institutions.
V04	Merit	Peer reviewed grant authority, NCRIS allocation authority	Grant number or Grant ID NCRIS facility allocation ID or similar

The metadata concepts will be collected and registered in a simple spreadsheet with the supplied template (Appendix 3). The template will have examples to guide applicants. Each research project or activity will be recorded as a row and metadata values as columns. Each application can provide as

² Taken from the EU [GDPR](#) regulation framework for responsibility in data protection, in the absence of a clear definition of similar entity in the (Australian Privacy Principles) or from the Australian OAI and Australian Privacy Act 1988. Data Publisher or Data Custodian is sometimes used to describe a role similar to Data Controller

many research projects/activities (rows) as are eligible, i.e. can fulfil ALL metadata criteria. Each institutional register will remain private and while no public registration is required for this phase (in contrast to Phases 1&2) those data collections identified for post-project retention will benefit from already recording over half the required metadata to reach the ARDC metadata standard required by the model being developed in the Data Retention Project.

Project Delivery

To streamline this investment delivery, we will undertake a series of three (3) public webinars where all interested parties can ask questions and discuss delivery options with the ARDC Data Retention Project Manager. After the webinar series applications will open via a single 'application for support'. Applicants should be able to demonstrate the capability and authority to undertake the work requested in this call, specifically:

Capacity

For the purposes of this investment partnership, a total single copy volume should be calculated as a sum of estimates from all eligible research projects and activities. A register of projects and activities together with the required metadata will be required on application. For clarity this investment will not consider measures for resilience such as backup, duplication or redundancy.

Capability

Applicants should manage the infrastructure or capacity that maintains eligible data output in accordance with good operational practice such that standardised metadata can be collected and recorded in the template register. Infrastructure or capacity can be operated in house or via third party provision (e.g. cloud services).

Authority

It is essential that applicants possess the authority from rights holders to collect and register the requested metadata criteria even though these metadata are not public or sharable at the current stage. It is anticipated that a proportion of data collections from this investment will persist and benefit from further support, should this become available, according to the ARDC Data Retention Model; i.e. registered in the DataCite public metadata registry and accessible via a data repository according to licence conditions or legislative obligations.

Stage 1: Public announcements and webinars

Public notification will be made on 15th September 2022.

There will be two (2) public webinars scheduled prior to application opening for interested parties to post and ask questions and register their interest in application. A further public webinar will be scheduled prior to applications closing on the 4th November 2022.

Webinar 1: 22nd SEPTEMBER 2022

Webinar 2: 29th SEPTEMBER 2022

Webinar 3: 28th OCTOBER 2022

Stage 2: Application for Support

Applications for Support will be accepted from all eligible parties from 6th OCTOBER 2022 until the 4th NOVEMBER 2022.

Applications close 4th NOVEMBER 2022

Three (3) components are required for application:

1. Contact details and a short statement on the anticipated benefits to the researchers, the organisation and the Australian research sector (max 300 words - Appendix 2)
2. Applicants will submit a project register in the form of a spreadsheet listing projects as rows together with eight (8) metadata values related to support criteria (see above) as columns. Each project row will include an estimate of project required storage. (A template register plus examples is provided in Appendix 3)
3. Applicants will also submit a financial budget detailing a proposed allocation for this partnership according to the requirements of ARDC co-investment. (Appendix 4).

Stage 3: Assessment

The ARDC Data Retention Project team will assess each application (register of projects, benefits statement and allocation budget) against the following criteria in order of priority:

- Completeness of application. All support criteria metadata for all nominated projects must be present
- Available funds
- Organisational representation when compared to existing partners in the Data Retention Project³, NCRIS facilities, ARDC partners and other universities

³ noting that existing partners in the Data Retention Project Phases 1 & 2 may still apply.

Stage 4: Commencement

Successful applicants will be notified by 18th NOVEMBER 2022.

Commencement may occur (via executed contract) at any date between 19th NOVEMBER 2022 and 31st JANUARY 2023.

Contracts must be executed by the 31st JANUARY 2023 or any offer of support will be withdrawn.

The general terms and conditions of ARDC contracts will be provided as part of this project documentation (Appendix 5).

DELIVERABLE 1: Project register

The project register provided in application for support will form the first deliverable. It will be a spreadsheet representation list of ALL nominated collections together with eight (8) metadata related to support criteria using the template provided in Appendix 3.

MILESTONE 1: Contract execution (70% of calculated investment)

An investment value will be determined as a function of total allocation capacity estimate from Deliverable 1 and the unit subsidy AUD\$ 100/TB.

70% of total investment will be available upon contract execution.

Stage 5: Project Closure

The Data Retention Project Phase 4 is scheduled to close on 31 DECEMBER 2023.

At least one (1) calendar month before project closure, all partners will submit an audit of investment outcomes that classifies the actual capacity for each project in the partner register.

- Complete - Research project completed during investment period:
 - Actual TB storage capacity used during project date range (P41)
- Ongoing - Research Project ongoing during investment period:
 - Current TB storage capacity allocated
- Transferred - Research project completed during investment period:
 - Final TB storage capacity for transition to a formal data collection, e.g. transferred to a data repository.

Applicants will be expected to provide realistic and auditable estimations on storage requirements according to current ARDC terms and conditions (variance in estimations is expected).

Further or greater support cannot be guaranteed (project requirement more than expected).

DELIVERABLE 2: Capacity Audit

Each project allocation will be enumerated as some combination of the three classification estimates above.

Classification will be submitted as an amended project register with three further columns added to Deliverable 1 for each project row.

MILESTONE 2: Closure investment (30% of calculated investment)

30% of total investment will be available at project closure

Project Timeline

Date	Alt Event
12/09/2022	Public notification commences
22/09/2022	Webinar 1 (public)
29/09/2022	Webinar 2 (public)
6/10/2022	Application For Support Opens
28/10/2022	Webinar 3 (public)
4/11/2022	Application For Support Closes
18/11/2022 - 31/01/2023	Contracts executed
17/07/2023	Webinar 4 - Audit Guidance (investment partners only)
17/10/2023	Webinar 5 - Audit Guidance (Investment Partners Only)
17/11/2023	Deliverable 2 - Closure Audit
31/12/2023	Project closes

Examples

Example 1: Single application

A University identifies 100 projects that collectively have estimated a requirement for 2000TB of data storage capacity. This applicant provides an enterprise data storage facility in house.

A calculated contract value will cap the ARDC investment at \$200k and the applicant will allocate at least a further \$200k as a matched investment.

The commencement allocation (\$140k) is used to secure FTE by the partner to design and trial accurate and complete metadata are captured as data capacity is utilised by the research projects.

At phase completion the partner returns an audit.

The closure allocation (\$60k) is used to integrate RDM processes into operational service development frameworks.

Example 2: Lead organisation from collaborative project : Expansion

An Australian Data Partnerships project is led out of an individual University. The project is eligible for support from the Phase 4 investment as the receipt of NCRIS derived investment. Other eligible projects within that university are also identified, e.g. from formal grant funded research. University service providers collate the relevant metadata on all eligible research projects into the research project register as part of their application for Phase 4 Investment.

The ADP project is seeking support for 500TB to enable scaling of already invested capacity. In addition, the university infrastructure service team identifies a further 600TB from 30 unrelated research projects and activities but who can also fulfil the metadata requirements of Phase 4.

A total of 1100TB is estimated

@ \$100/TB that corresponds to a contract of \$110k

Storage capacity is procured with \$77k commencement investment from third party commercial cloud supplies as a cost-effective and timely investment needed by the time critical projects within the university

When the closure audit is returned, procurement of on-premise storage capacity is subsidised for the other research projects without time critical needs using the remaining \$33k closure investment released.

Example 3: Multiple organisations from collaborative project: Amplification

The Platform project, "Australian Platform Cloud" is generating large and increasing volumes of data and is a partnership across a University and 3 NCRIS facilities. Depending on the architecture of their data infrastructure (centralised or distributed) they may apply as a single lead organisation as in Example 2 or multiple organisations.

Architecture 1: Centralised on one lead partner.

2000TB at one site that provides the storage infrastructure.

>Outcome 1: 1 contract, 2000TB, \$200k

\$140k is released at commencement to procure capacity to meet the anticipated needs of the single project.

When an audit report is returned a further \$60k is released to manage data products into formal and reusable data collections.

Architecture 2: Data storage architecture is distributed across all partners.

A distributed architecture also distributed the storage capacity burden. This will not prevent application to Phase 4, rather it will amplify the model outcome by causing multiple applications from all relevant project partners.

The APCloud estimates 500TB at the hosting university, and a further 500TB at each of three NCRIS facilities hosted at other universities. Each of the 4 host institutions will collate additional, unrelated eligible projects according to the Phase 4 project register requirements.

e.g.

University 1 500 + 1000 TB = 1500TB (\$150k)

University 2 500 + 1000TB = 1500TB (\$150k)

University 3 500 + 500TB = 1000 TB (\$100k)

University 4 500 + 1500TB = 2000TB (\$200k)

>Outcome 2: 4 contracts, 6000TB, \$600k

Commencement funds are released according to the relative storage calculator for each participant.

Each participant will also be required to supply a register of projects to make commencement and also a project closure audit to release the contract balance at closure.

Glossary

Data Retention Project Phase 4 Statement

ARDC will partner with eligible organisations to support underpinning capacity to maximise the likelihood that data output from nationally meritorious research projects can be managed according to current RDM principles and rapidly identify those collections that would benefit from possible future support as nationally significant research data.

Key Terms

Term	Context for the purposes of the Data Retention Project Phase 4
Eligible Organisations	Australian Universities and NCRIS capabilities who are supporting activities or research projects according to NCRIS principles, and: <ul style="list-style-type: none"> ● Give due regard to infrastructure lifetimes and operational overheads. ● Demonstrate a commitment to the FAIR data principles. ● Can consolidate all eligible project storage requirements and 8 metadata criteria into a single application.
Support	The ARDC will co-invest as partners with eligible organisations to support important national collections as they emerge. The ARDC will require at least 1:1 co-investment with matched cash contributions from each partner.
Data Output	Research data output arising from nationally meritorious or strategic research. Such data are generally characterised as ‘active’ or ‘in flight’ and informal collections but whose potential can be maximised via contemporary RDM practises.
Nationally meritorious or strategic research	Research funded via competitive research funding programs, or undertaken through the principles and/or resources of the NCRIS programme. Evidence for merit can be grant numbers or NCRIS facility allocation references.
Nationally Significant Research Data	Research data collections that can demonstrate significance as <ul style="list-style-type: none"> ● part of the scholarly record, ● output from peer reviewed research funding or, ● output from an NCRIS facility.

Appendix 1. NCRIS Principles

Taken from the [2018 NCRIS Guidelines](#) - Appendix A

The key principles underpinning NCRIS are that:

- Australia's investment in research infrastructure should be planned and developed with the aim of maximising the contributions of the research and development system to foster innovation, economic development, national security, social wellbeing and environmental sustainability
- infrastructure resources should be focussed in areas where Australia is, or has the potential to be, world-class (in both discovery and application driven research) and provide international leadership
- major infrastructure should be developed on a collaborative, national, nonexclusive basis. Infrastructure funded through NCRIS should serve the research and innovation system broadly, not just the host/funded institutions. Funding and eligibility rules should encourage collaboration and co-investment. It should not be the function of NCRIS to support institutional level (or even small-scale collaborative) infrastructure
- Access is a critical issue in the drive to optimise Australia's research infrastructure. In terms of NCRIS funding there should be as few barriers as possible to accessing major infrastructure for those undertaking meritorious research, including the use of preferential arrangements for meritorious researchers
- due regard be given to the whole-of-life costs of major infrastructure, with funding available for operational costs where appropriate
- NCRIS should seek to enable the fuller participation of Australian researchers in the international research system
- NCRIS should enable Government initiatives which seek to maximise opportunities for industry and international engagement and commercialisation of research
- data generated, created, captured or stored by NCRIS funded projects will be made available to the wider research community based on the F.A.I.R. principles, appropriately implemented for individual research communities. Data must be stored to an appropriate level of security
- new projects, and additional investment in existing projects, should be based on a robust business case.

Appendix 2 - pro forma contact details and benefit statement

Institution/NCRIS facility:

Contracting entity:

Contracting entity Address:

Applicants

First Name | Last Name | Position | Email | Phone number

First Name | Last Name | Position | Email | Phone number

etc

Benefit Statement: Max 300 Words

Appendix 3 - MS Excel template for project register

[Download ms excel template](#)

Appendix 4 - Budget Template

File budget template for download

Appendix 5 - General ARDC T&C