An interoperable and secure model to support data mobility across the research eco-system

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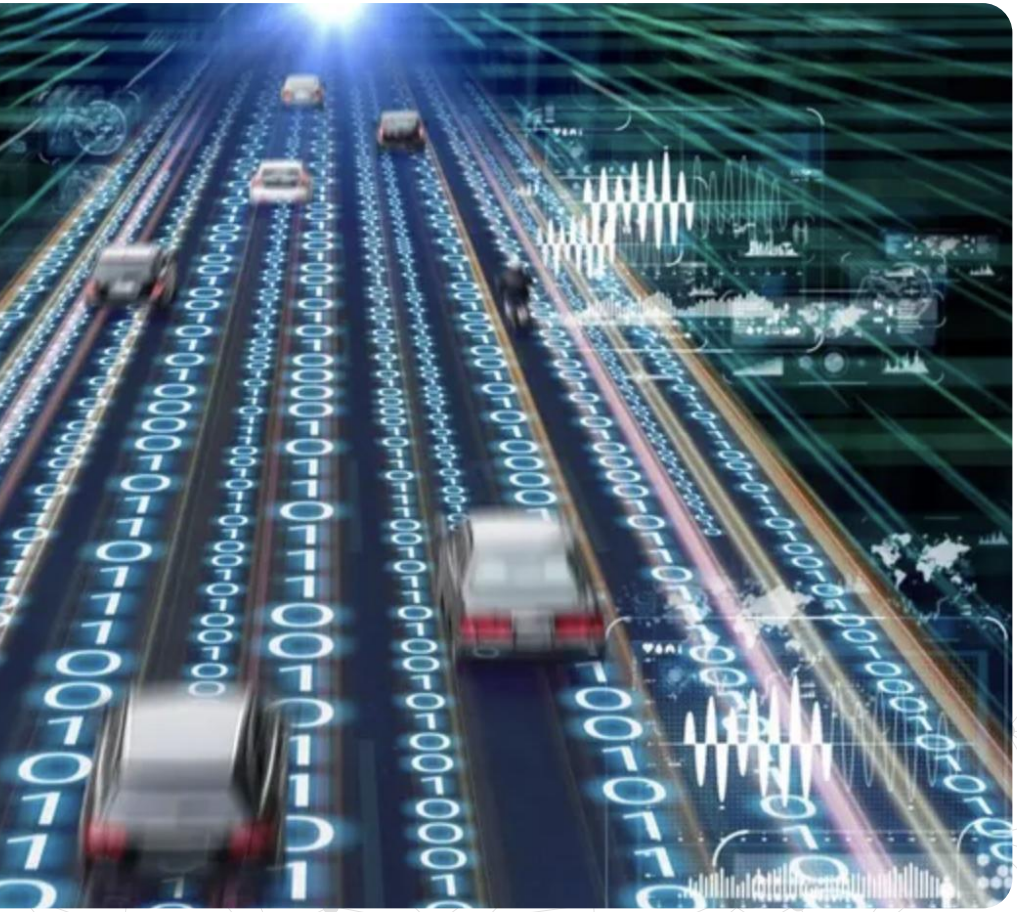


What's the problem?

As research becomes increasingly collaborative and data-intensive, **data transfer remains a problem**.

Why do we care?

The AARNet network provides **high-capacity connectivity** essential for conducting cutting-edge research.

Why Globus?

Data transfer platform from the University of Chicago used extensively at supercomputer centres and major research facilities.

Data transfer remains a problem for the sector

As **research becomes more data intensive**, researchers encounter more data handling and movement challenges as part of their research data management practice.

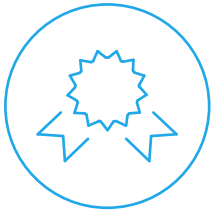
Large datasets, often terabytes in size, are now common in fields like **genomics, climate modelling, and astronomy**.

Image courtesy: Dr S. Beecroft thesis “Moving Data with wheelbarrows”

Australia's National Research and Education Network (NREN)

Pioneered the internet in Australia in 1989

Not-for profit company



Licensed telecommunications carrier

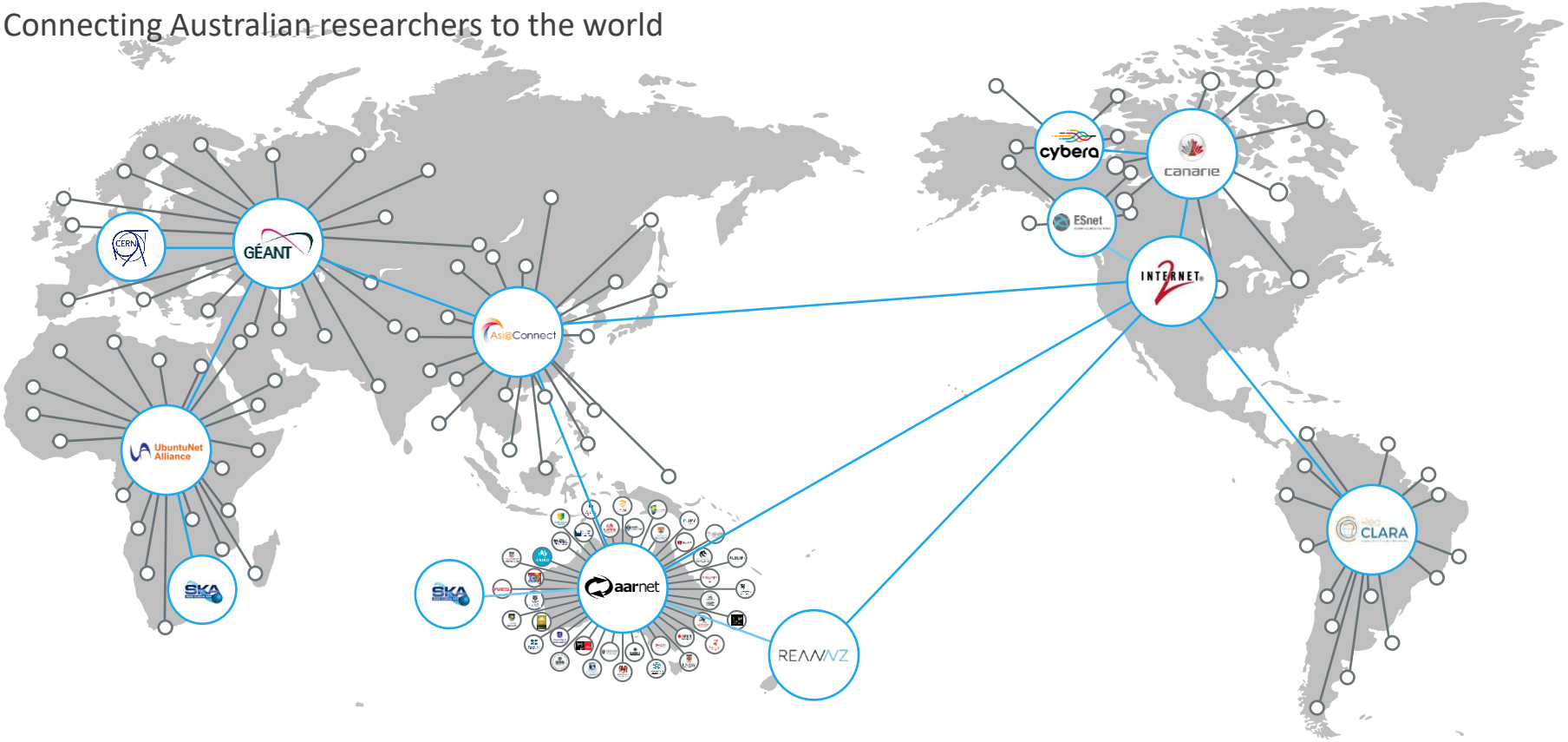
Owned by 38 universities and CSIRO

Serves more than 2 million people

Proudly Australian owned and operated

Advanced Research and Collaboration

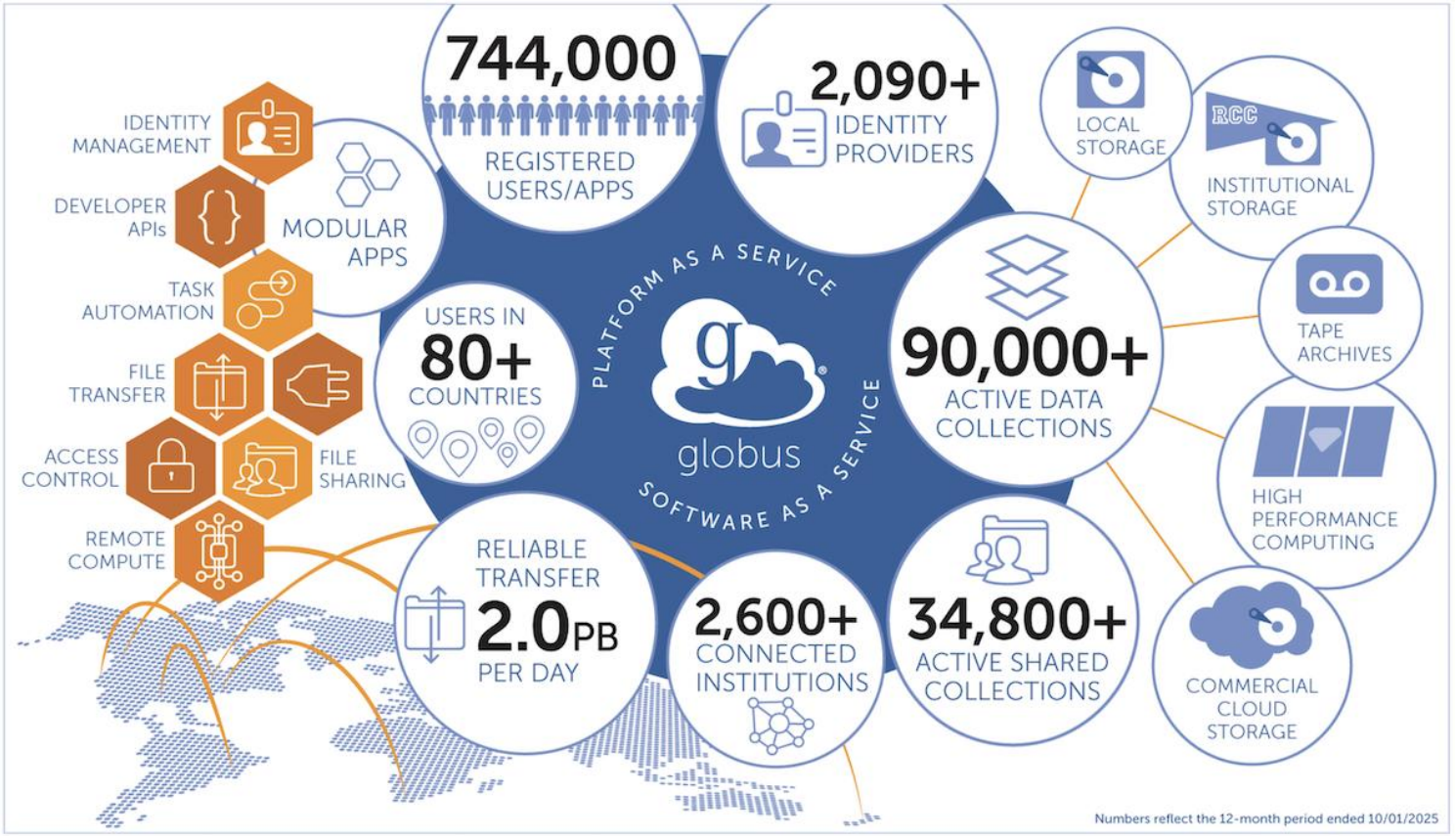
Connecting Australian researchers to the world



> Highly connected, accessible, reliable access to infrastructure and data within Australia and out to the world, so researchers can focus on the science rather than moving data.

Globus.org

Globus.org

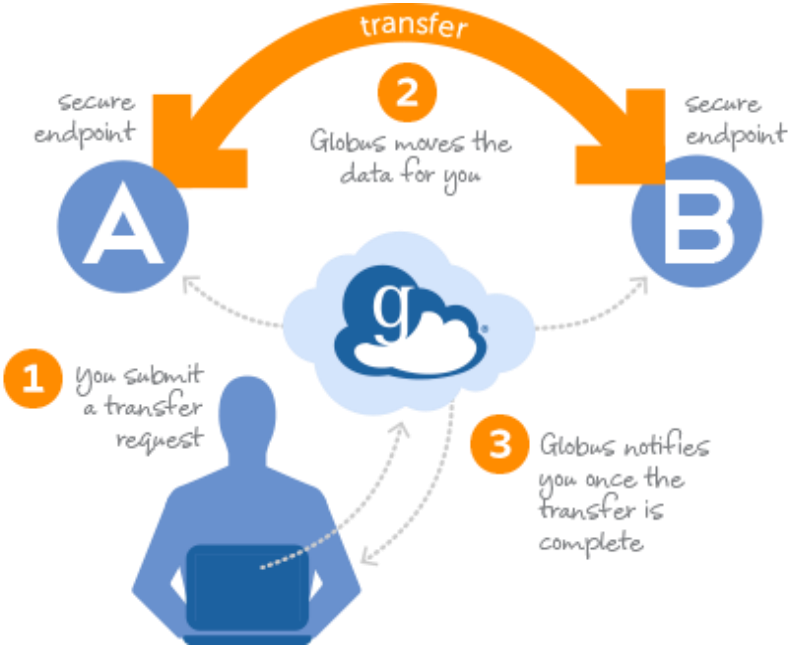


Streamlining large data transfers

Globus is optimised for transferring massive datasets (**terabytes to petabytes**) quickly and efficiently, leveraging the AARNet high-speed research network.

It provides a single interface for accessing **data stored across various systems**, from personal laptops to high-performance computing clusters.

Researchers can easily share data across institutions using Globus endpoints, enabling **seamless collaboration in distributed environments**.



Apollo service – Australian BioCommons

Supporting research continuity through reliable infrastructure

Due to an infrastructure change, the Australian Apollo Service needed to urgently migrate **15 TB of research data** from Pawsey's Nimbus Cloud to the national Nectar Research Cloud node hosted by AARNet.

With help from AARNet, the Apollo team created the Globus endpoints in less than a day. The transfer ran over Easter 2025 successfully moving all 15 TB without interruption disruption to the service.

MeerKAT telescope

Global-scale data movement

Astronomers studying long-period radio transients with **South Africa's MeerKAT telescope generate up to 2 TB per session.** Transferring large radio astronomy datasets from South Africa to Australia was presenting a significant logistical challenge.

Using Globus over fast, reliable international networks has reduced transfers from weeks down to minutes, enabling scientists to go straight from observation to analysis.

Intelligent Pavement Assessment Vehicle (iPAVE)

Managing big data from a fleet of mobile laboratories

The National Transport Research Organisation (NTRO) collects **massive road survey datasets** using their fleet of advanced vehicles with precision sensors to measure pavement strength.

Using Globus, data is transferred from vehicles to the cloud in near real time, enabling rapid validation and analysis. Results now reach agencies within hours, improving transport safety and efficiency.

Data mobility is hard without better coordination and consistency across institutions

The problem: data transfer bottlenecks

Data generating facility

National compute facility

Institutional data storage facility (raw data)

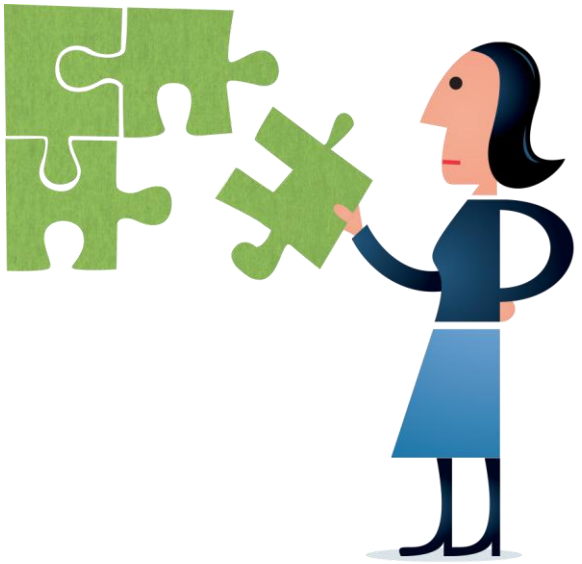
Institutional data storage facility (analysed data)

Each arrow is a potential data transfer bottleneck

Managing complexity

Navigating data-intensive research challenges

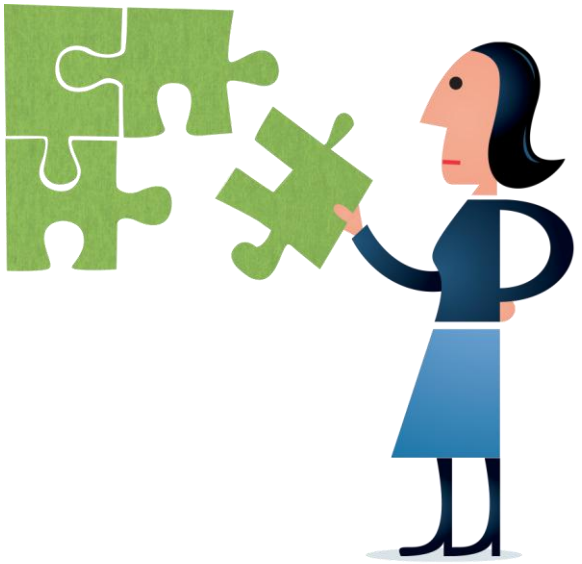
- Achieving seamless data mobility in scientific research faces significant **challenges that span technical, regulatory and institutional domains**.
- **Regulatory compliance and data sovereignty** represent the highest-impact challenges.
- While moving data from A to B tends to be simple, data movement becomes complicated when you need to manage the **volume, velocity, and variety of research data**.
- The ability to move, access and reuse data across platforms, institutions and communities is essential for advancing both **FAIR and CARE** principles in scientific research.



Consistency through governance

Ensuring reliability, security and long-term value

- Facilitating **data movement between institutions** with differing security domains, storage systems, or network configurations requires **a level of coordination and standardisation of efforts**.
- **Consistency across data transfer nodes** is essential to ensure reliability, trust, and efficiency across the network.
- The Globus.org platform can serve as the technical infrastructure for these transfers, but **we need a community-lead governance framework to provide operational effectiveness and a reliable, secure foundation for research collaboration**



Governance committee

Ensuring reliability, security and long-term value

- We are seeking **4-5 volunteers to form our Globus Governance Committee** to help draft our governance framework.
- Position **governance as complementary to existing institutional processes**, explicitly excluding research planning, ethics, and data standards.
- A **community-lead governance framework** will establish a consistent foundation for operating a network of data transfer nodes, ensuring **operational reliability, security and long-term value for the AU/NZ research community**.

AARNet is a not-for-profit company that provides ultra high-speed Internet and communications services only to Australia's research and education sector

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Thank you