

Developing realistic solutions to the PIDs challenges in developing regions



Members

A global repository network

COAR is an international association with 162 members and partners from 50 countries, representing libraries, universities, research institutions, government funders and others.

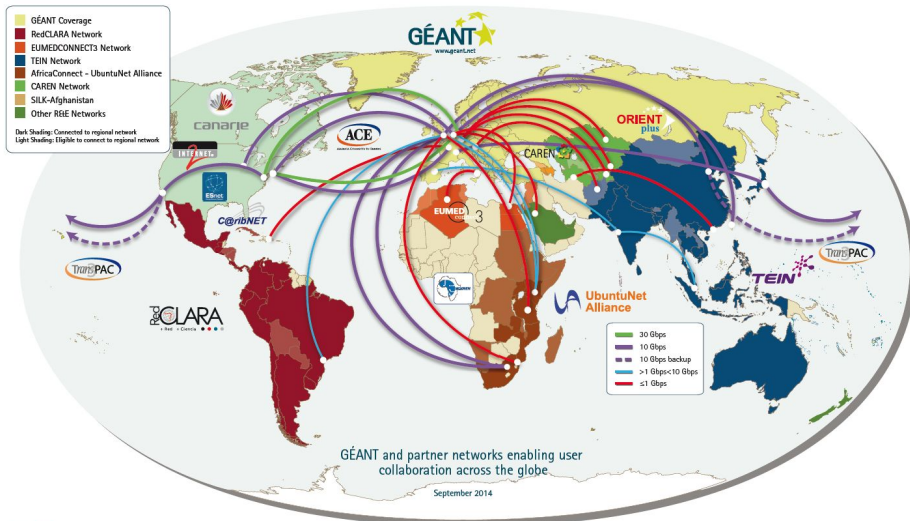
MEET OUR MEMBERS



Research is global!



At the Heart of Global Research
and Education Networking



Research is local!



Fostering Bibliodiversity in Scholarly Communications

A Call for Action!

April 15, 2020



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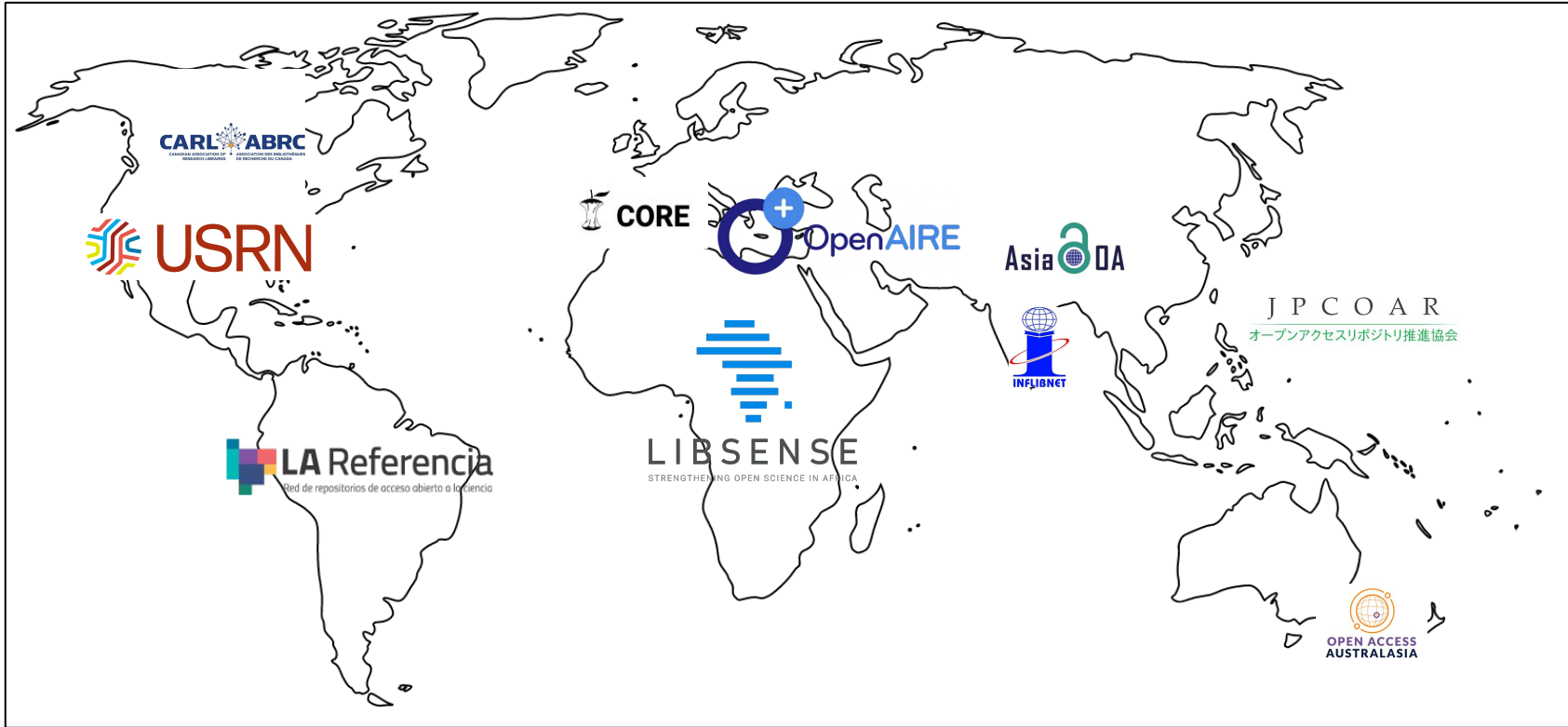
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The global scholarly communication system must, not only be open, but **must accommodate the different workflows, languages, publication outputs, and research topics, and funding levels**



*Distributed control of scholarly infrastructures is a strength because it makes infrastructure **more sustainable, responsive to local needs** and at **less risk to buy-out or failure**.*

How to balance these two elements?

Local

- Localized, open infrastructures and services
- Governance
- Communities of practices

Global

- Interoperability and harmonization
- Global discovery
- Co-designing technologies and services





Persistent Identifiers: Addressing the challenges of global adoption

The aim of this blog post is to raise awareness about certain issues related to the adoption of persistent identifiers (PIDs), which especially impact developing countries and to propose an alternative approach that will enable greater global inclusiveness and more widespread adoption of PIDs across the world. Persistent Identifiers (PIDs) are an important part of... [Read more](#)

DOIs - Three main issues for developing regions

- Unrealistic pricing models
- Controlled by the global north / not reflective of the global south context
- Complexity of the infrastructure



PIDsLink by WACREN: A Sustainable and Inclusive Approach to Persistent Identifiers in Africa

Omo Oaiya
Chief Strategy Officer, WACREN

ABOUT WACREN

West and Central African Research and Education Network



VISION

To be a world-class infrastructure and services for the West and Central African Research and Education community, for development.



MISSION

To build and operate a world-class network infrastructure, develop state of the art services, promote collaboration among national, regional, international research and education communities and build the capacity of the REN community



MEMBERS

WACREN has 20 national members across the West and Central African region.
Membership categories: NREN Member, Associate and Premium Associate

A decade of AfricaConnect and counting...

The latest iteration, AfricaConnect3 (AC3) seeks to unlock the **potential of education and research** through increased access of African R&E institutions to digital infrastructures and technologies.



Output 1:

Access to affordable and adequate e-infrastructure is increased.



Output 2:

Dedicated R&E services and applications are developed.



Output 3:

Adequate human resource capacity and expertise is built.



Output 4:

Digital transformation in research and education is raised.

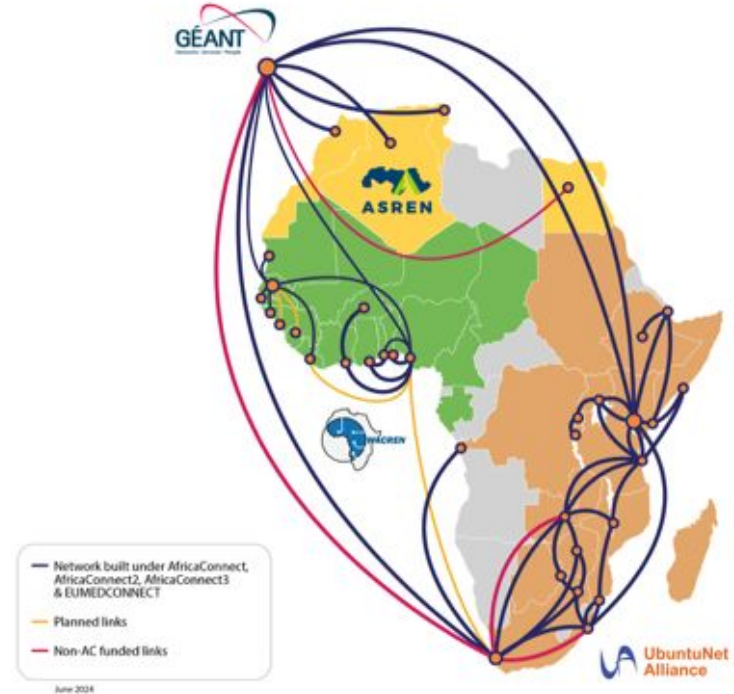
Connectivity of NRENs in Africa

Since AfricaConnect started in 2011, **23 out of 38 African** NRENs have been connected to their regional network:

- **UbuntuNet Alliance 13:** Botswana, Burundi, DRC, Kenya, Malawi, Mozambique, Rwanda, Somalia, South Africa, Tanzania, Uganda, Zambia and Zimbabwe.
- **WACREN 6:** Ghana, Nigeria and Togo, Benin, Burkina Faso and Côte d'Ivoire.
- **ASREN 4:** Algeria, Egypt, Morocco and Tunisia.

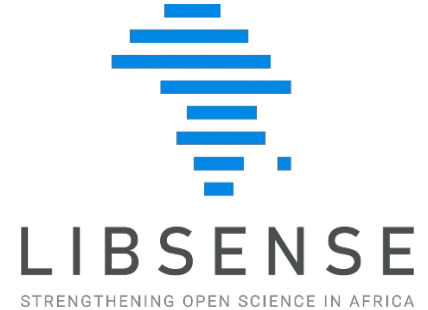
WACREN connecting Guinea-Bissau, Guinea, The Gambia, Liberia, Senegal, Sierra-Leone & Mauritania to regional backbone in AC3.

AC4 Coming Soon – 2025 - 2029



MUCH MORE THAN JUST CONNECTIVITY

- Capacity building and deployment of R&E services for open access – **Open Science Policy & Infrastructure**
- **Trust and Identity** services for a transparent and secure access to shared resources when necessary.
- **Video infrastructure** services to support digital education.
- Proactive **cybersecurity** for the members and their digital assets



ARK Alliance



ORCID



Roadmap for Implementing
Persistent Identifiers in Africa

<https://zenodo.org/records/7970386>

The African PID Challenge

- Financial barriers with defacto schemes make them unsustainable
 - High costs of minting DOIs, budget constraints, currency fluctuations
- Infrastructure and governance should align with the needs and contexts of African institutions.
- PID choices should reflect diverse linguistic, cultural, and economic contexts of Africa



ARKs made simple by
WACREN

<https://pidslink.wacren.net>



#NREN ARKs Service Provider

- Archival Resource Keys (ARKs) as a defacto PID.
 - 21+ years, 1035 institutions, billions of IDs in the wild.
 - found in the Data Citation Index, HathiTrust, Wikipedia, Wikidata, Internet Archive, ORCID profiles, etc.

In contrast to other PID schemes, ARKs have

- no fees, no limits, no walled gardens (decentralised)
- very flexible metadata, including none
- can be assigned to anything digital, physical, or conceptual

There is no conflict in using ARKs and other identifiers at the same time

Our Proposal for Africa

PROPOSAL DEFINED



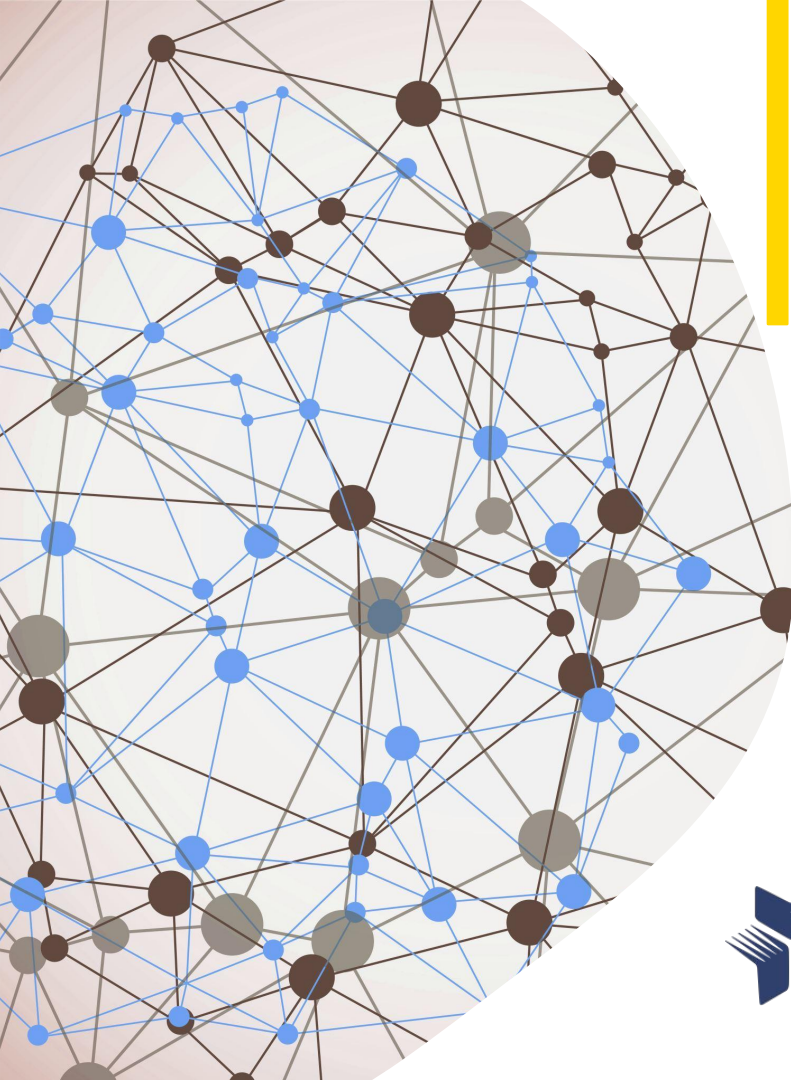
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- Establish National PID Strategies and working groups to implement
- Tailor feasible costing models to the local economic context.
- Explore diverse funding options and emphasise collaborative governance.

Next Steps & Expected Outcomes



- **Raise Awareness:** Increase understanding of the importance and challenges of PIDs among research leaders.
- **Stakeholder Engagement:** Generate interest in supporting national PID strategies.
- **Infrastructure Pilots:** Participation in PIDsLink projects.



dARK: A decentralized blockchain implementation of ARK Persistent Identifiers in Latin America

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ibict

Instituto Brasileiro de Informação
em Ciência e Tecnologia



LA Referencia

Red de repositorios de acceso abierto a la ciencia

What is dARK?

- dARK is the first implementation of a technology that could be the base for a low-cost and decentralized services to mint/resolve ARK persistent identifiers
- dARK is an ARK implementation based on institutional blockchain nodes, the data is owned, stored and controlled not by one single organization but by all participants in a "public good" network.
- This open and community driven project is fostered by Instituto Brasileiro de Informação em Ciência e Tecnologia (IBICT-Brazil) with the later collaboration of LA Referencia/RedCLARA (supported by SCOSS)



The Global Sustainability Coalition for Open Science Services (SCOSS)



LA Referencia

THE FEDERATED NETWORK OF
LATIN AMERICAN OPEN
SCIENCE REPOSITORIES

LA Referencia provides some essential elements for the development of the international Open Science ecosystem.

It was founded 10 years ago and brings together twelve countries along with RedCLARA, our regional research and education network. It provides a tool that facilitates the international harvesting, validation, and enrichment of metadata from repositories. It offers value-added services and responds to the interoperability challenges of the new OpenAIRE guidelines. This tool is increasingly being adopted outside of Latin America (Spain, Portugal, Africa). It addresses the growing need for integration with research management systems (CRIS) and aims to produce statistics to serve national decision-makers when evaluating research.

By supporting LA Referencia, you will help us develop new services such as a decentralised, sustainable and global persistent identifier service based on blockchain and extend the current usage statistics service to other infrastructures/regions contributing to a more equitable international publishing system.

WHY HAS IT BEEN DEEMED AN ESSENTIAL INFRASTRUCTURE?

LA Referencia enables open science as a public good through its federated network of open access institutional repositories in Latin America. It is governed and funded by Latin American governments and supports the implementation of Open Science policies. SCOSS funding will help develop two innovative services around sustainable persistent identifiers and usage statistics, promoting bibliodiversity, and the development of new indicators based on open science. LA Referencia is aligned with the SCOSS theme FAIR Open Access repository services.

Why are we developing dARK?



*The **need** not only of **persistent but unique/deduplicated** identifiers to build better research graphs, indicators and research assessment tools.*

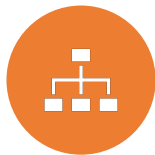


***Lack of PID coverage on Global South** repositories/journals mainly because of the **costs** that those **services/fees** represents for the institutions.*



*Most persistent identifier systems are **based on centralized models**, depending on **few agencies** that support the service infrastructure.*

Why decentralized?



Increased autonomy and flexibility, reduces costs: Decentralized management of PIDs allows for greater autonomy and flexibility among different stakeholders.



Reducing single points of failure: By distributing the responsibility of managing PIDs across multiple entities, a decentralized approach helps mitigate the risk of a single point of failure.



Promoting innovation and diversity: Decentralization fosters an environment that encourages innovation and diversity in the development and implementation of PID systems.

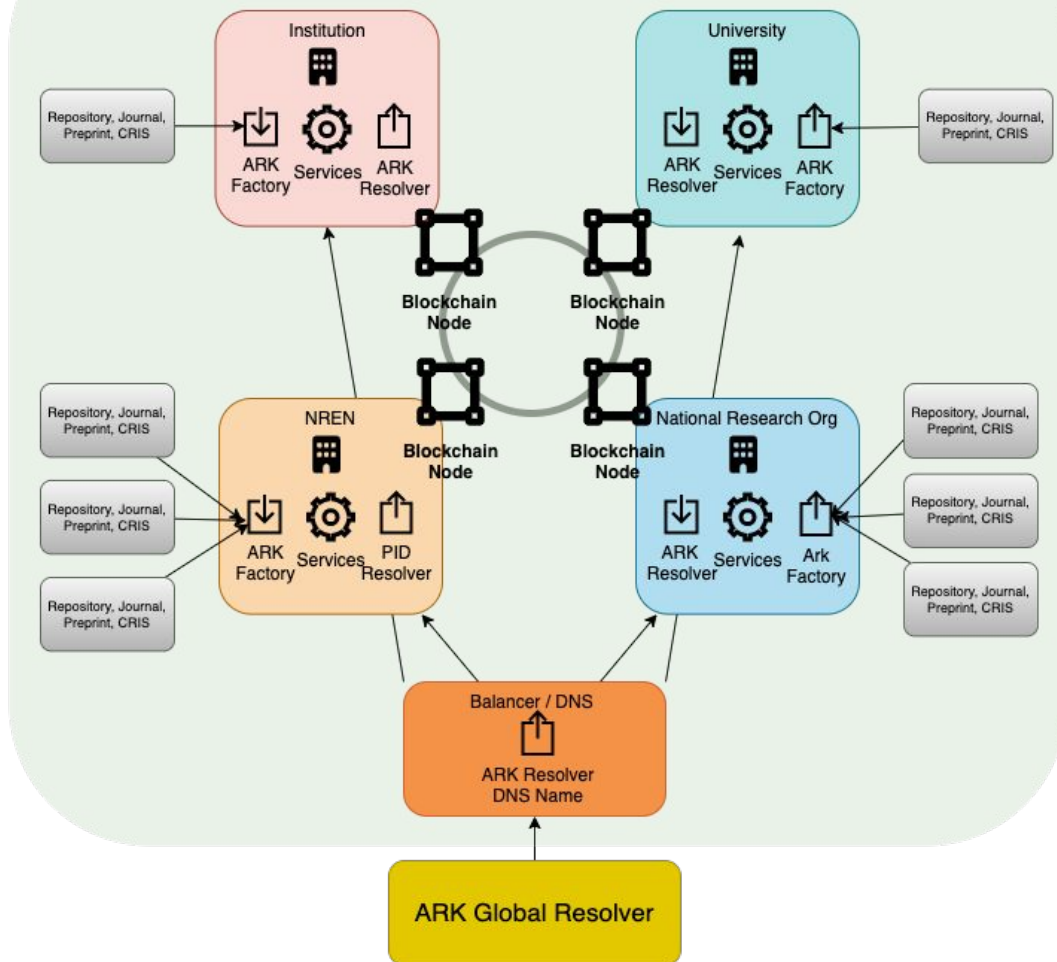


Scalability and adaptability: Decentralized systems can be more scalable and adaptable to changing circumstances.



Trust and transparency: A decentralized approach promotes trust and transparency by distributing authority and decision-making power among multiple entities.

Dark Persistent Identifier Network



dARK Network



Current achievements - first half of 2024

- Production and sandbox blockchain networks on IBICT, RNP, and LA Referencia nodes, expanding the reach and accessibility of the dARK infrastructure.
- Massively assign dARK identifiers to harvested institutions using national aggregator (Brasil) with institutional NAANs (Global ARK identifiers), facilitating seamless integration and widespread adoption.
- Universal resolution service for all assigned records by redirecting to the digital object via a single DNS, enhancing the efficiency and reliability of identifier resolution.

Second half 2024 goals

Provide metadata access for each digital object through agnostic storage links, ensuring comprehensive and standardized metadata management (first implementation based on OAI-PMH Metadata)

Conduct feasibility studies and reports on decentralized metadata storage and deduplication layer, provide insights for the project's progression.

Discuss the governance and sustainability of dARK in Latin America, aiming to expand its reach from Brazil to other countries in the region, fostering collaboration and mutual support among diverse stakeholders.

Publicize all code to enable dARK's utilization and enrichment by other communities within the global open science ecosystem





"through innovation and collaboration, the dARK project is not just bridging gaps in research accessibility—it's paving the way for a more inclusive and decentralized academic future."

Questions and discussion