Open Science Platform Artifact

Eduardo Oliveira

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1 Open Science Platform

1.1 Overview

The Open Science platform aims to empower researchers and members of the scientific community by providing a secure, transparent, traceable and tamper-proof environment for sharing project artifacts and data. Building on this objective, the platform leverages decentralized technologies to ensure the integrity and reliability of shared information.

1.2 Technology Stack

The Open Science platform is built upon a robust technical foundation, comprising:

- Hyperledger Iroha v1 Blockchain: The core infrastructure for account management and transaction recording and business rules enforcement through Smart Contracts ensuring secure and transparent data exchange.
- IPFS (InterPlanetary File System): The decentralized storage for project artifacts and metadata, guaranteeing tamper-proof and persistent access to shared information.

Aside from the decentralized technologies above, the platform also relies on the following off-chain, centralized components:

- Jupyter Notebooks in Python: The front-end interface of the platform leverages Jupyter Notebooks in Python to automate and display the execution steps of the activities in the platform.
- Apache Tika: Utilized for extracting file metadata, enhancing the platform's ability to manage and describe artifact content.
- Woosh: For efficient indexing and search capabilities for artifacts stored on the platform.

1.3 Operations

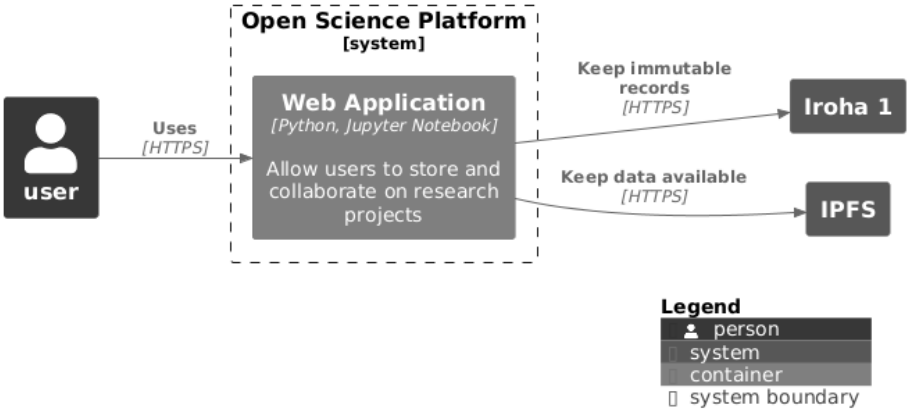

Figure 1: System diagram for the Open Science Platform.

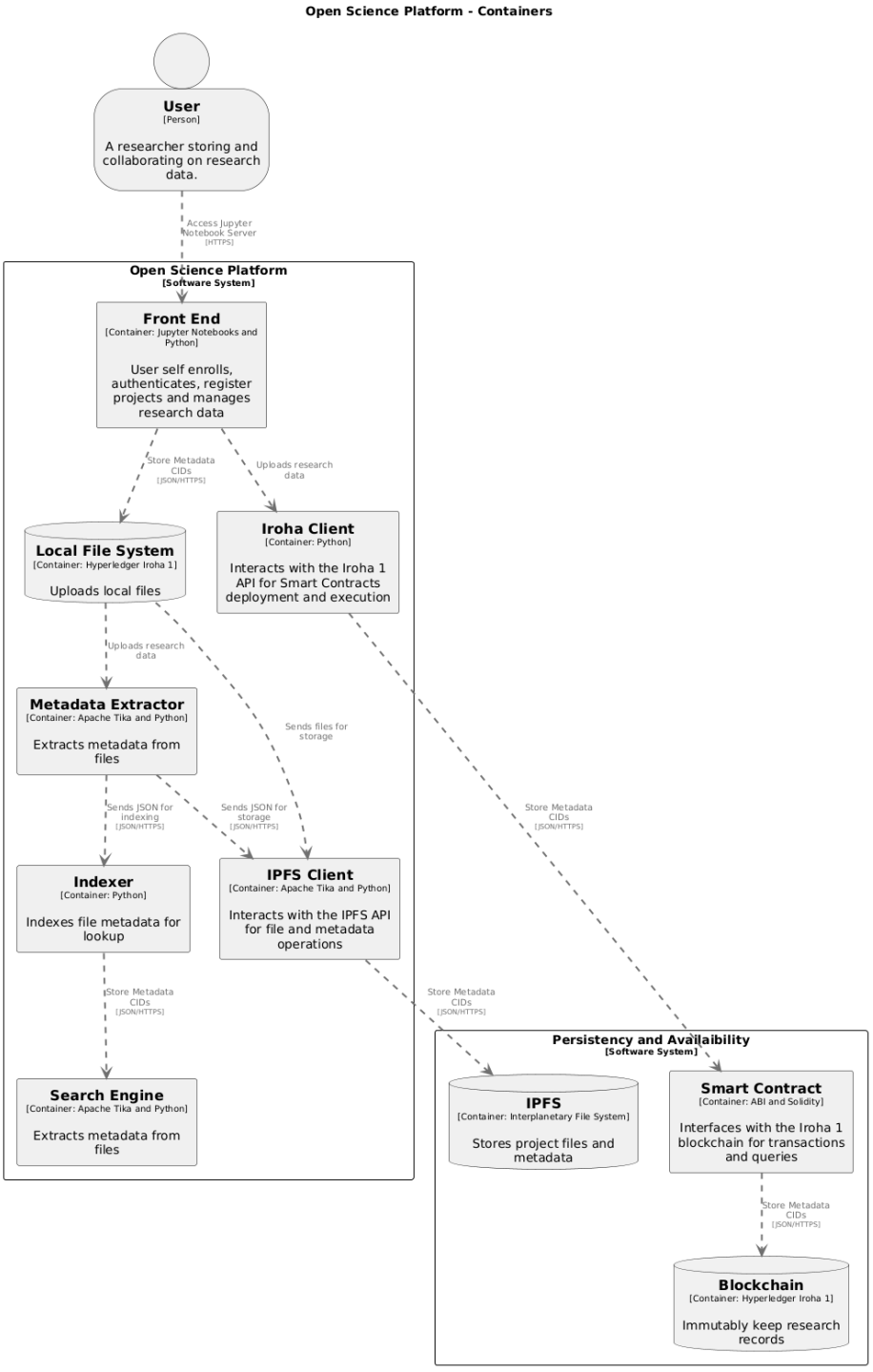

Figure 2: System diagram for the Open Science Platform.

1.4 Operations

Entity	Attribute	Description
`foaf:Person`	foaf:name	The name of the person.
	foaf:mbox	The email address of the person.
`foaf:holdsAccount`	schema:identifier	The account name of the person in the blockchain.
	schema:roleName	The role of the person in the platform.
	schema:publicKey	The cryptographic public key of the account in the blockchain.
`foaf:Organization`	foaf:name	The name of the organization the person belongs to.
`schema:identifier`	propertyID	The type of identifier is ORCID (Open Researcher and Contributor ID).
	value	The actual ORCID value for the person.

1.5 Project Account

Entity	Attribute	Description
`foaf:Person`	foaf:name	The name of the person.
	foaf:mbox	The email address of the person.
	foaf:holdsAccount	Links the person to an account.
`foaf:Organization`	foaf:name	The name of the organization.
	foaf:location	The physical or digital location of the organization.
`schema:identifier`	propertyID	The type of identifier (e.g., ORCID).
	value	The actual identifier value.

2 Entity-Relationship Diagram

The diagram below represents the relationships between various entities extracted from the given JSON-LD data. The main entities in the diagram include:

- **foaf:Person** – Represents an individual, identified by attributes such as name, email, and affiliation.
- **foaf:Organization** – Represents an institution or organization to which a person is affiliated.
- **foaf:holdsAccount** – Represents an individual's digital account, containing an identifier, role, and public key.
- **schema:identifier** – Represents a unique identifier (such as an ORCID) assigned to a person.

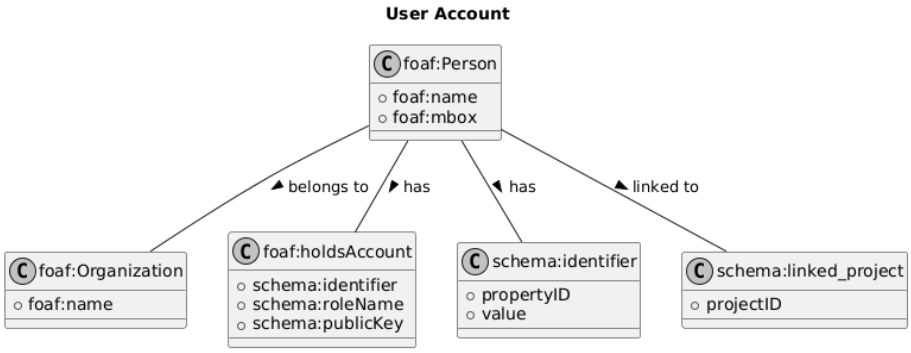

Figure 3: Entity-Relationship diagram for the user account.

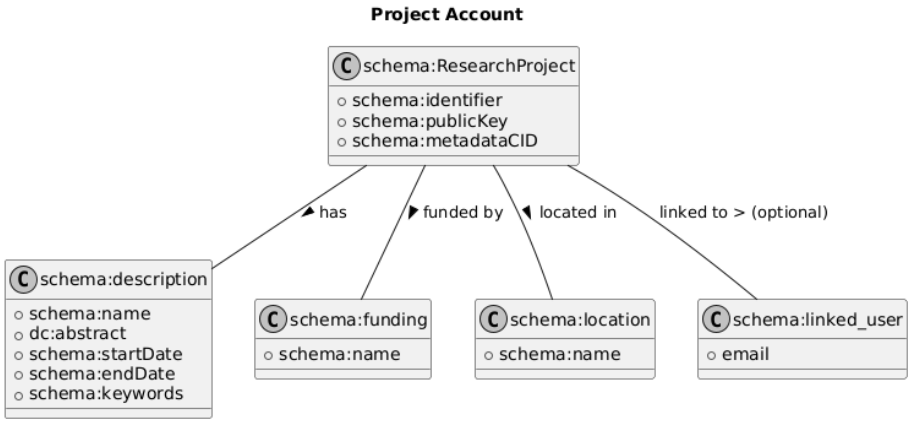

Figure 4: Entity-Relationship diagram for the project account.