An ODRL Profile to join them all for Data Spaces

Joaquín Salvachúa
Andres Muñoz

Universidad Politécnica de Madrid

UNIVERSIDAD POLITÉCNICA DE MADRID

Information Processing and Telecommunications Center

In partnership with

Mission

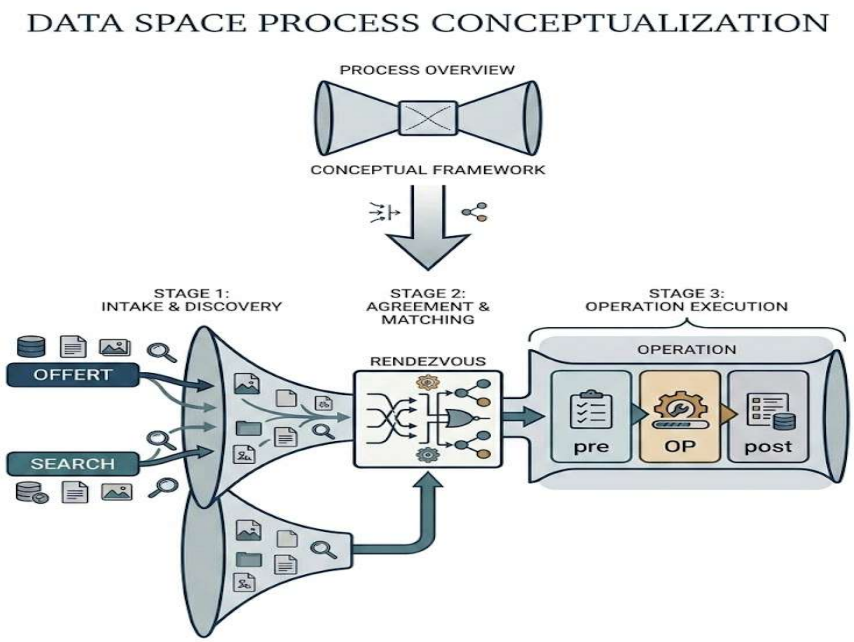
- Data Spaces has a complex workflow, that could be slightly different on each implementation.

- Have a profile that serves as container for all the different uses of ODRL that may be involved into data spaces.

- More to come (catalog searching and others).

- https://w3c.github.io/odrl/profile-bigdata/
- (note big data was the initial name since they do not know about data spaces)

One profile to bind them all
Serving as container for a given dataspace



DataSpace offering to be publish in catalog

ODRL with RDF serialization is NOT for normal Humans.

Proposals

- ODRL4H : arrow notation
- Graphical notation based on Blockly (ongoing work)
- Set notation to indicate all posible offering + semantic anotation:
  - Must / May /Maybe on the offers ODRL statements.

ODRL4H

Use arrows -> to indicate action and prohibitions.

- # Permission with condition
- DataOwnerX -> Permit -> Action(Read) -> Asset(Report_2026) -> Condition(<= "2026-12-31")
- # Prohibit Action
- DataOwnerX -> Prohibit -> Action(Anonymize) -> Asset(Report_2026)
- # Obligation
- DataOwnerX -> Oblige -> Action(Read) -> Asset(Report_2026)

The Sidecar Pattern (policy-env.yaml)

All the URL needed for rdf. So ODRL4H.txt + **policy-env.yaml**

https://github.com/EunomiaUPM/Odrl4Humans

Set notation

The ODRL4H language maps directly to the ODRL 2.3 Information Model. We define the vocabulary of the language using the following discrete mathematical sets:

- $\mathbb{P} = \{p_1, p_2, \ldots, p_n\}$: The set of all valid **Parties** (e.g., *Assigners* and *Assignees* resolved via the environment lookup).
- $\mathbb{R} = \{\text{Permit}, \text{Prohibit}, \text{Oblige}\}$: The strict, finite set of core **Rule Types**.
- $\mathbb{A} = \{\text{Action}(a_1), \text{Action}(a_2), \ldots\}$: The set of all executable **Actions**.
- $\mathbb{E} = \{\text{Asset}(e_1), \text{Asset}(e_2), \ldots\}$: The set of all target **Assets** (Entities).
- $\mathbb{C} = \{\text{Condition}(c_1), \text{Condition}(c_2), \ldots\}$: The set of all logical **Constraints** mapping to ODRL leftOperand, operator, and rightOperand.
- $\mathbb{D} = \{\text{Duty}(d_1), \text{Duty}(d_2), \ldots\}$: The set of all subsequent **Duties** (Obligations) attached to a permission.

$$\Sigma \equiv p_{src} \xrightarrow{\text{MAYBE}} r \xrightarrow{\text{MUST}} a \xrightarrow{\text{MUST}} e \xrightarrow{\text{MAY}} p_{dst} \xrightarrow{\text{MAY}} c \xrightarrow{\text{MAYBE}} d$$

We must go to the rendezvous

After searching in the catalog the DCAP-AP metadata must include an offer like ODRL.

We must instantiate it with a rendezvous negotiation

Semantics should be more formal specified (also on what may be the compensations and are one or a process).

After this we transform the Set notation in the normal ODRL profile

Operations

Pre conditions :

Previous to start working what must be fullfilled

What trust framework/model are we using.

Part of the Access control : Use Rebac (Google zanzibar) model in order to specify what data you could connect with:

Translate into ETL commands that do not Access data no allowed.

Ongoing stremming datra dycamically restrain data produced to be transmited.

Operations

Normal conditions just enforced

Data usage control :: impact on data sovereignty

- Use / Process: Performing computations or algorithmic transformations on the dataset without modifying the primary source.
- Aggregate: Combining the dataset with other third-party sources to generate synthetic metrics or insights.
- Anonymize / Pseudonymize: Redacting or altering identifiers in real-time before data lands in secondary environments.

Post operation

Post conditions

Related to ensure some actions are done:

- Copy / Store: Writing the data to local persistent storage (caches, databases, file systems).
- Share or transmitting the data provider's assets to a third-party actor outside the initial transaction boundary.
- Delete / Purge: Cryptographically shredding or erasing the data from all consumer-controlled environments.

Studing the relationship with a posible governance layer (actions and events between both layers). Ongoing work.

The key is how to ensure this in the platform => produce a detector for this environment as agent.

Ongoing work on the W3C ODRL group

First version about to be publish on june.

ODRL group temporal closing and reopening to add the full specification of the proposal specification.

Reopen the sub specificacions in september.

Input for the forecoming future of ODRL brainstorming meeting.

Future work

Develop all the sub profiles (some are done, while others are ongoing).

Check the proper integration of different transpilation process.

Offer an Open Source tool that integrates this with data spaces (Eunomia) :: END SEPTEMBER.

Thank you!

Name| email

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