# W3C Workshop on the Future of ODRL: ODRL and Verifiable Credentials

**W3C Workshop on the Future of ODRL (20 & 21 July 2026)**

Yassir SELLAMI, Tech Lead, Gaia-X

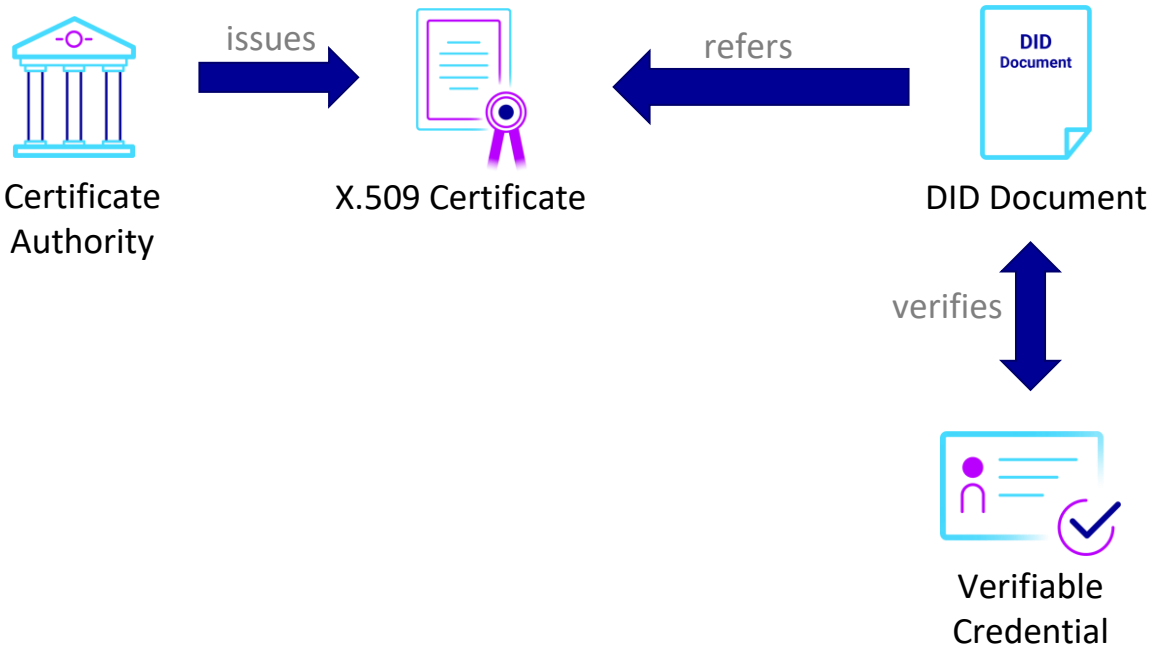
20 July 2026 | London, UK

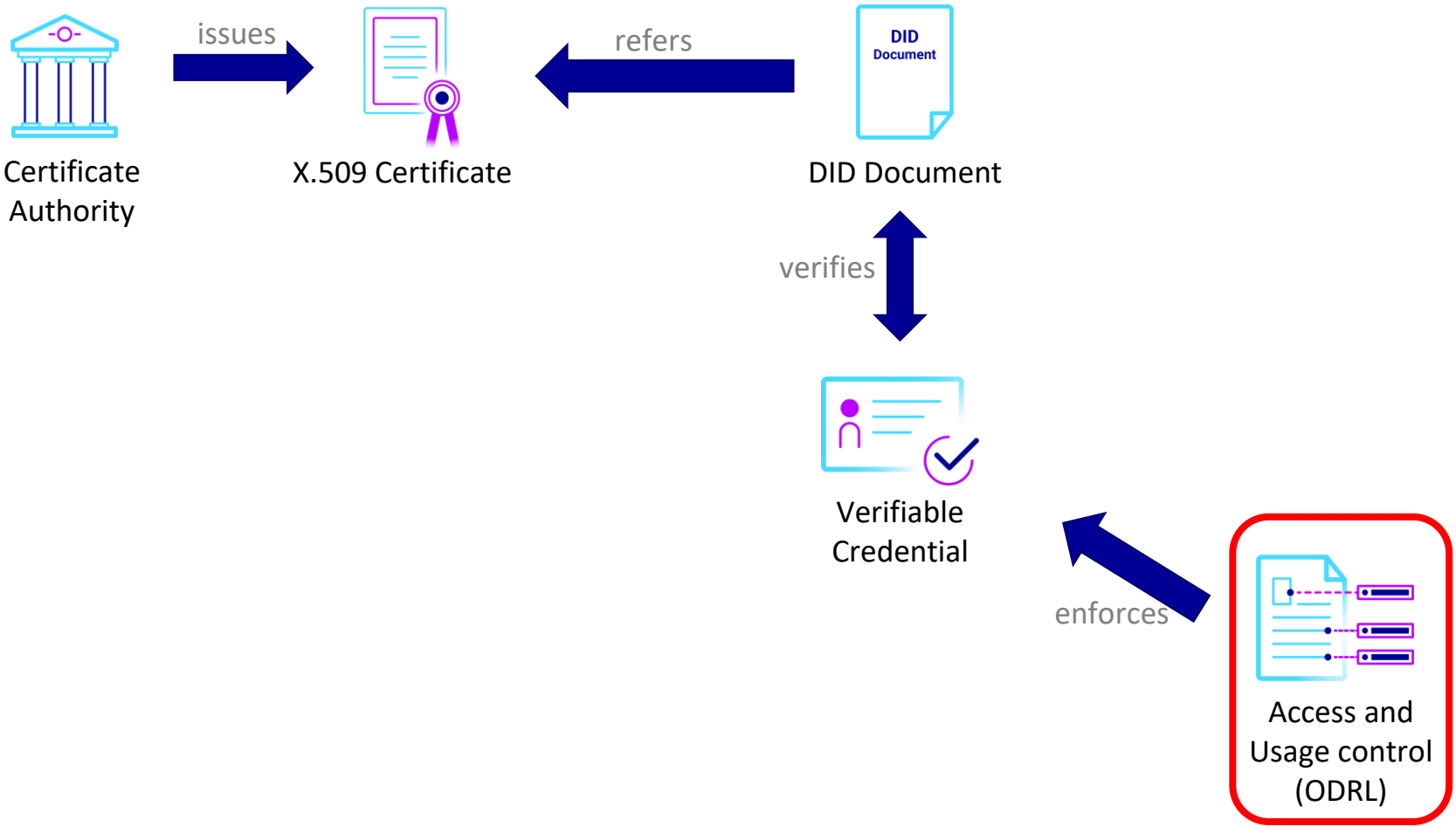
# Gaia-X European Association for Data and Cloud AISBL

## Mission and vision

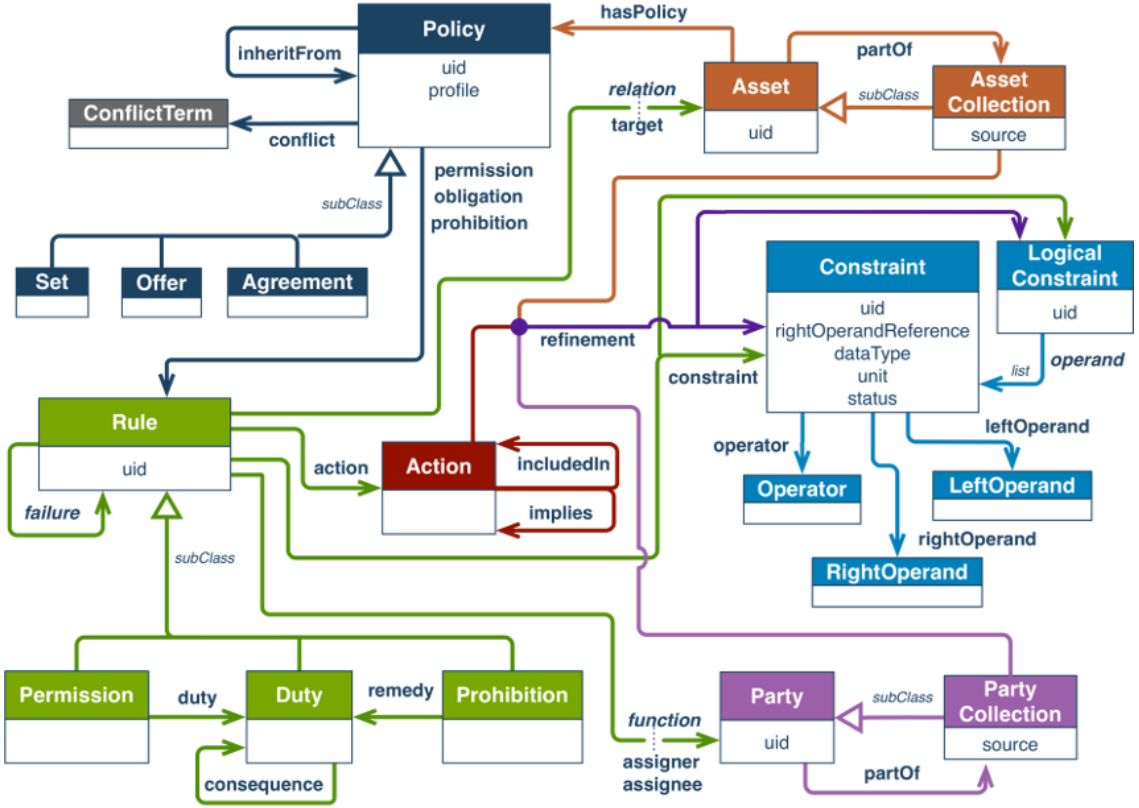
**VISION:** Enable trusted decentralised digital Ecosystems.

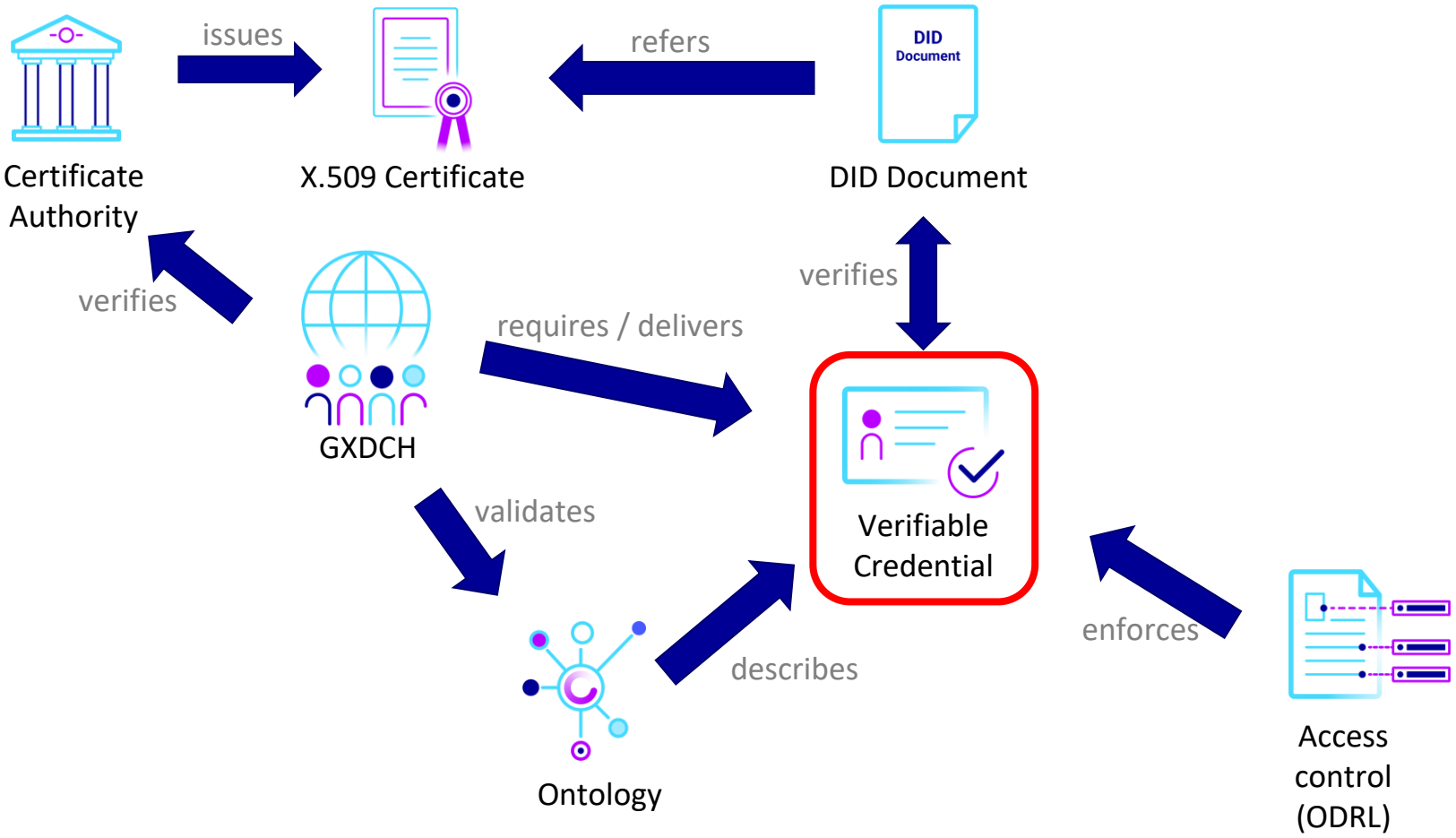
**MISSION:** Creating the de facto standard to enable federated and trusted data and infrastructure ecosystems, by developing a set of specifications, rules, policies, and a verification framework.


issues
refers
DID
Document
Certificate
Authority
X.509 Certificate
DID Document
verifies
Verifiable
Credential

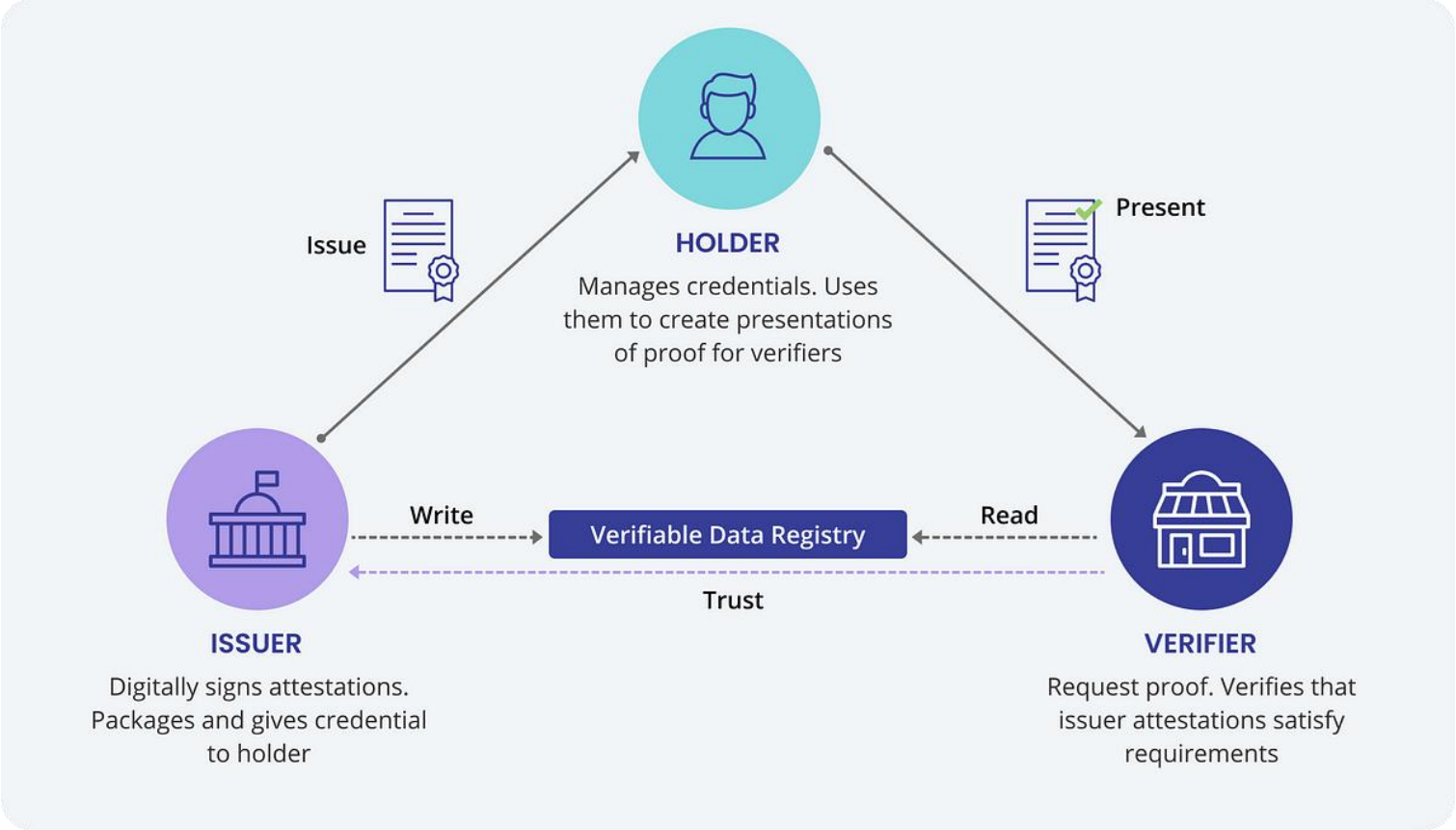

issues
refers
DID
Document
Certificate
Authority
X.509 Certificate
DID Document
verifies
Verifiable
Credential
enforces
Access and
Usage control
(ODRL)

# ODRL (Open Digital Rights Language)




issues
refers
DID
Document
Certificate
Authority
X.509 Certificate
DID Document
verifies
verifies
requires / delivers
GXDCH
validates
Verifiable
Credential
describes
enforces
Ontology
Access
control
(ODRL)

# Verifiable Credentials



# Verifiable Credentials


```
{
  "@context": [
    "https://www.w3.org/ns/credentials/v2",
    "https://w3id.org/gaia-x/development#",
    {
      "vcard": "http://www.w3.org/2006/vcard/ns#",
      "schema": "https://schema.org/"
    }
  ],
  "id": "https://gaia-x.eu/.well-known/legal-person.json",
  "type": ["VerifiableCredential", "gx:LegalPerson"],
  "issuer": "did:web:gaia-x.eu",
  "credentialSubject": {
    "id": "https://gaia-x.eu/.well-known/legal-person.json#cs",
    "schema:name": "Gaia-X European Association for Data and Cloud AISBL",
    "gx:registrationNumber": {
      "id": "https://gaia-x.eu/.well-known/vatID.json#cs",
      "gx:vatID": "BE0762747721",
      "gx:countryCode": "BE"
    },
    "gx:headquartersAddress": {
      "type": "gx:Address",
      "gx:countryCode": "BE",
      "vcard:street-address": "6-9 Avenue des Arts",
      "vcard:locality": "Brussels",
      "vcard:postal-code": "1210"
    }
  },
  "validFrom": "2026-03-05T09:58:45.603+01:00",
  "validUntil": "2027-03-05T09:58:45.603+01:00"
}
```

# The gap in policy evaluation

DATA PROVIDER → POLICY

## Policy Constraints

*What the Provider requires*

- **Constraint expressions**
  Formal rules specifying access conditions
- **Required credential type**
  e.g. membership, certification, role proof
- **Issuer & trust conditions**
  Who must have issued the credential

THE GAP

?

No mainstream standard mechanism exists to bridge these two sides

CREDENTIAL ← DATA CONSUMER

## Credential Presentation

*How the Consumer must prove the claims*

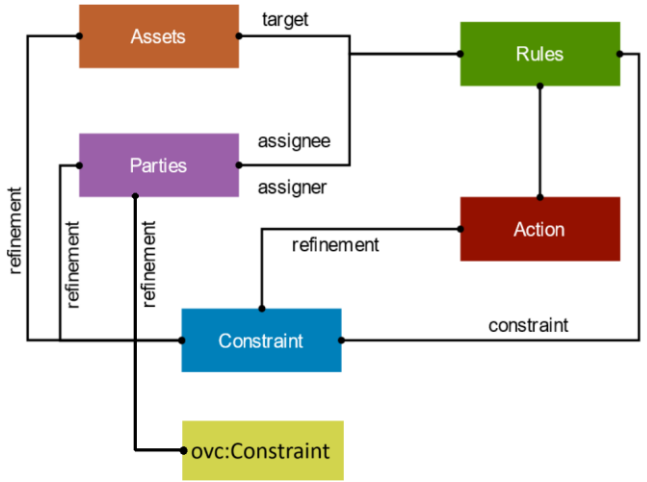
- **Which credential to use**
  No automated selection logic exists
- **Which format & protocol**
  VC, JWT, mdoc — no standard mapping
- **How to present it**
  No consistent standards-based method

**DATA GOVERNANCE**
Policies & access rules enforced

**SOVEREIGNTY**
Control all the shared claims

# ODRL VC Profile

- Give clear definition and syntax for custom constraint values
- Custom value formats for ovc:`leftOperand` and ovc:credentialSubjectType
  - ovc:leftOperand to contain a JSONPath for the intended attribute to evaluate
  - ovc:credentialSubjectType refer to the credential type
- Compatible with the base ODRL Information Model
- Would rely on ODRL, VC and JSONPath base specification



# Why verifiable credentials are ideal in this case

- Trustworthy claims
- Easy to target an attribute
- Possibility to set a “Trust Profile”
- No need to reinvent the wheel
  - Signature verification
  - Issuer validation
  - OID4VP and OID4VCI protocol
  - Compatibility with wallets

# Use Case: ODRL Offer


```
{
  "@context": [
    "http://www.w3.org/ns/odrl.jsonld",
    { "gx" :"https://w3id.org/gaia-x/development#" },
    { "ovc": "https://w3id.org/gaia-x/ovc/1/" }
  ],
  "@type": "Offer",
  "uid": "http://example.com/policy/partner-policy",
  "profile": "https://w3id.org/gaia-x/ovc/1/",
  "permission": [
    {
      "@type": "Permission",
      "target": "http://example.com/asset/123",
      "action": "http://www.w3.org/ns/odrl/2/use",
      "assigner": "http://example.com/provider",
      "ovc:constraint": [
        {
          "ovc:leftOperand": "$.credentialSubject.gx:registrationNumber.gx:vatID",
          "operator": "http://www.w3.org/ns/odrl/2/eq",
          "rightOperand": "FR61999428717",
          "ovc:credentialSubjectType": "gx:LegalPerson"
        }
      ]
```

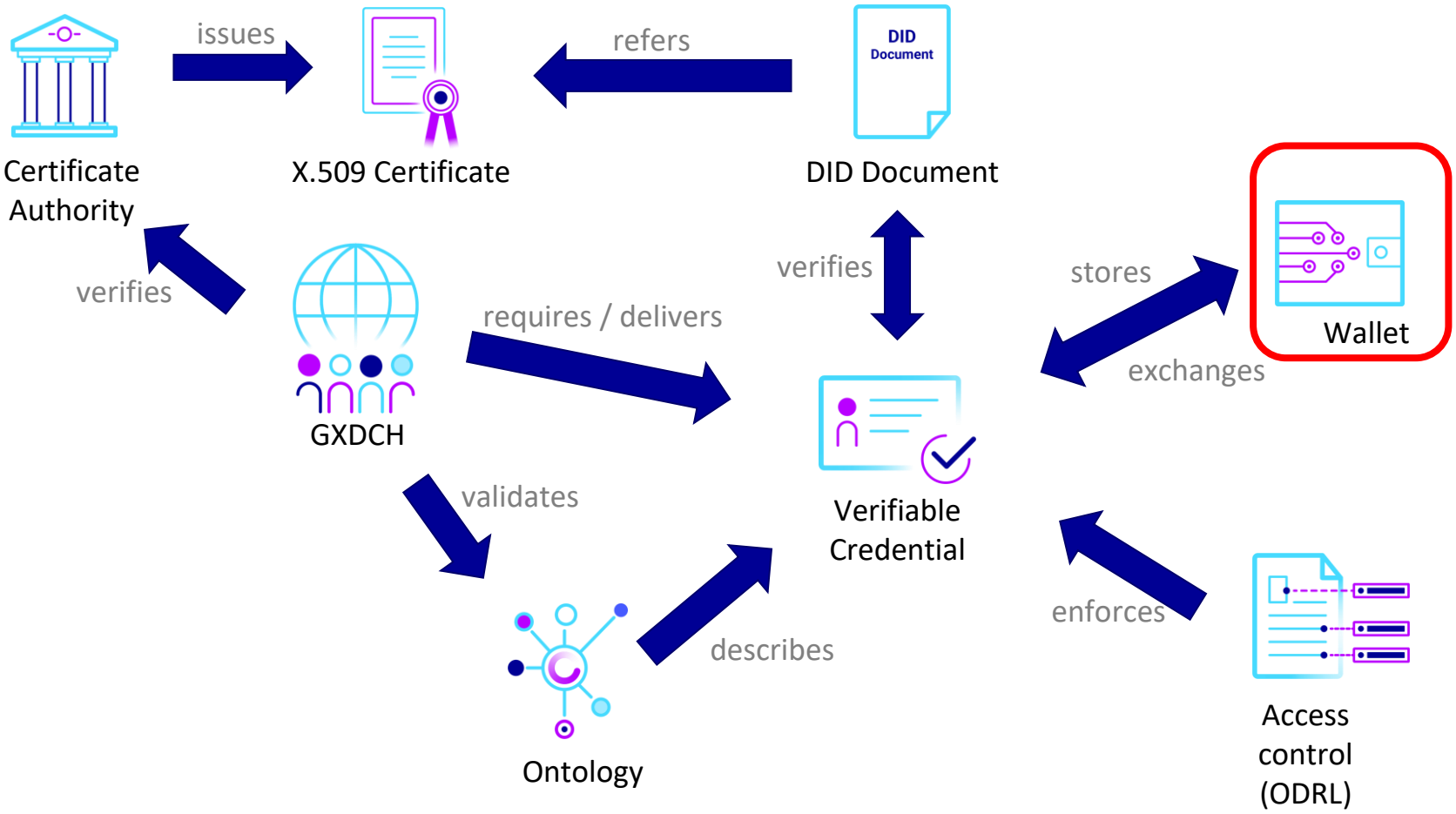
# Use Case: ODRL Request

```
{
  "@context": {
    "ex": "http://example.com/ns#",
    "odrl": "http://www.w3.org/ns/odrl/2/",
    "odrl-fs": "https://w3id.org/odrl-fs"
  },
  "@id": "ex:request",
  "@type": "odrl-fs:EvaluationRequest",
  "odrl-fs:requestedAction": "odrl:play",
  "odrl-fs:requestingParty": "did:web:gaia-x.eu",
  "odrl-fs:requestedTarget": "http://example.com/asset/123"
}
```

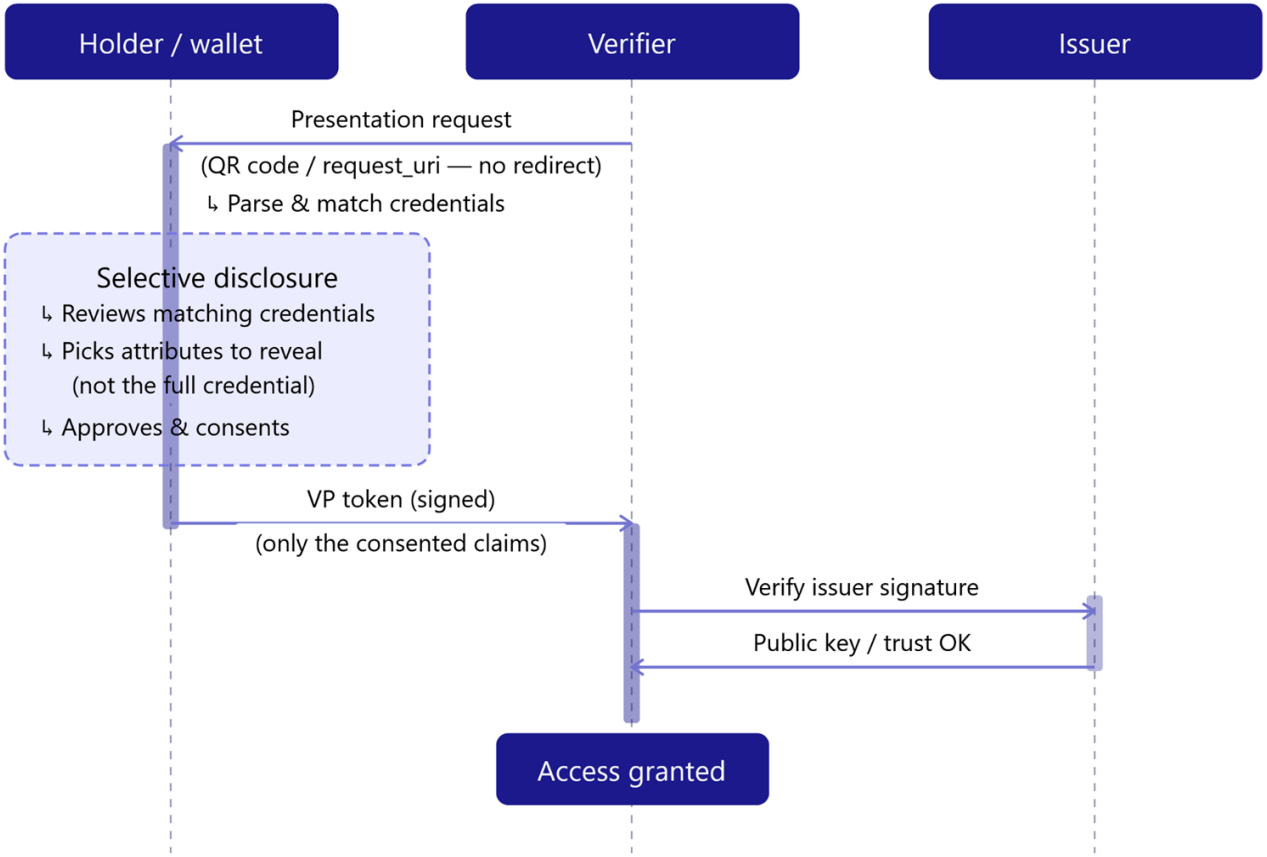
# Use Case: State of the world (consumer's credentials)


```
{
  "@context": [
    "https://www.w3.org/ns/credentials/v2",
    "https://w3id.org/gaia-x/development#",
    {
      "vcard": "http://www.w3.org/2006/vcard/ns#",
      "schema": "https://schema.org/"
    }
  ],
  "id": "https://gaia-x.eu/.well-known/legal-person.json",
  "type": ["VerifiableCredential", "gx:LegalPerson"],
  "issuer": "did:web:gaia-x.eu",
  "credentialSubject": {
    "schema:name": "Gaia-X European Association for Data and Cloud AISBL",
    "gx:registrationNumber": {
      "id": "https://gaia-x.eu/.well-known/vatID.json#cs",
      "gx:vatID": "BE0762747721",
      "gx:countryCode": "BE"
    },
```

# Use Case: Results


issues
refers
DID
Document
Certificate
Authority
X.509 Certificate
DID Document
verifies
verifies
stores
Wallet
requires / delivers
exchanges
GXDCH
validates
Verifiable
Credential
enforces
describes
Ontology
Access
control
(ODRL)

# OpenID4VP




OpenID

# Digital Credentials Query Language (DCQL)

DCQL (Digital Credentials Query Language) is a JSON-based query syntax that allows Verifiers to precisely describe which credentials and claims they require.

```
{
  "credentials": [{
    "id": "compliance",
    "format": "jwt_vc_json",
    "meta": {
       "type_values": ["VerifiableCredential", "ex:ComplianceCredential"]
    },
    "claims": [
      { "path": ["credentialSubject", "compliance", "status"] }
    ]
  }]
}
```

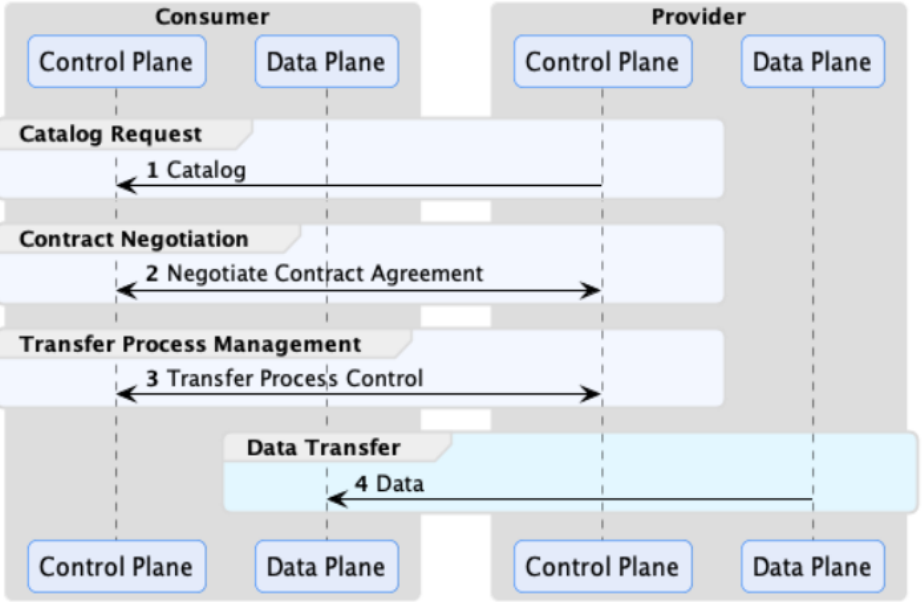
**Selective Disclosure**
Request only the claims you need

**Multi-Format Support**
SD-JWT, mdoc, JSON-LD

**Credential Combinations**
Query across multiple VCs

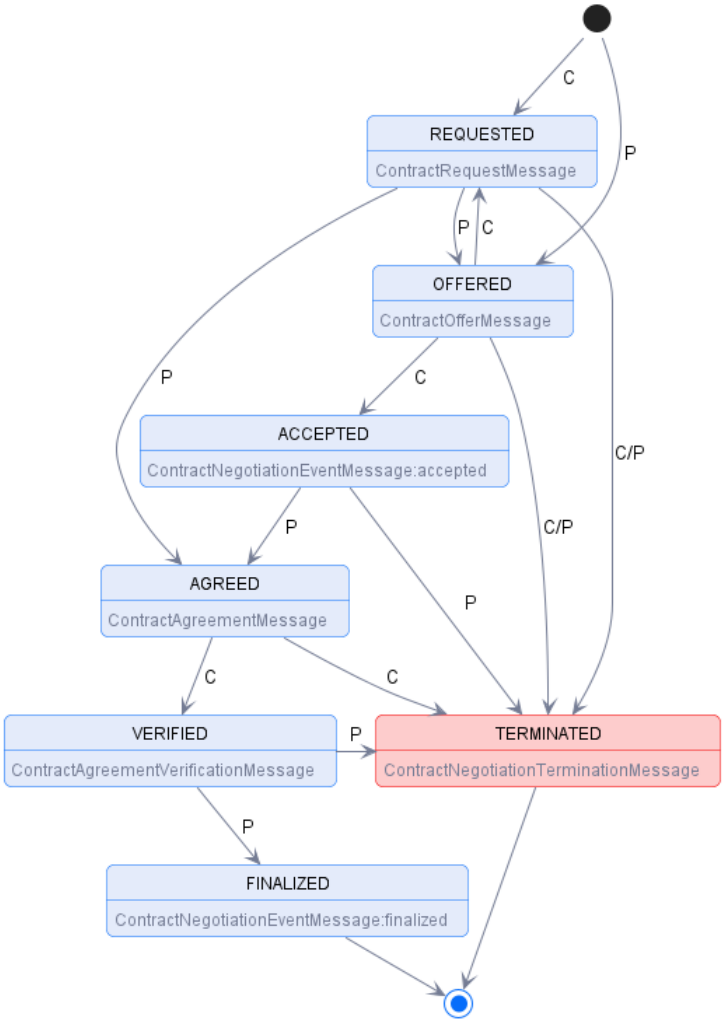
OpenID

# Dataspace Protocol




ECLIPSE DATASPACE

# Dataspace Protocol




ECLIPSE DATASPACE

# ODRL-VC Negotiation Protocol

A standardized end-to-end contract negotiation protocol that bridges ODRL access policies with W3C Verifiable Credentials. It enables Providers to enforce fine-grained, claim-based access control over datasets and services and Consumers to prove compliance through cryptographically verifiable credentials, without sharing unnecessary personal data.

## GOALS

### Enforce ODRL policies
Map ODRL constraints to VC presentation requests via DCQL

### Verify credentials
Cryptographically validate and exchange VCs through OpenID4VP

### Privacy minimization
Disclose only the claims strictly required by each constraint

## INCENTIVES

### Automated trust negotiation
Remove risks of misaligned credential checks from data-sharing workflows

### Dataspace interoperability
Compatible with Dataspace Protocol contract negotiation states

### Auditability & compliance
Persistent evaluation records satisfy regulatory traceability requirements

# Actors

## Provider

Provides access to datasets/services and publishes ODRL policies

**Runs or delegates:**

### Verifier

Builds DCQL requests and verifies presented credentials

### Policy Engine

Evaluates the ODRL policy

## Consumer

Negotiates contracts and requests access to datasets/services

**Uses a Wallet:**

### Wallet

- Standards-compliant OpenID4VP wallet
- Stores and exchanges Verifiable Credentials (VCs)
- Responds to DCQL-based Authorization Requests

# Artifacts

### ODRL Offer Policy

ODRL policy using the

*https://w3id.org/gaia-x/ovc/1/ profile*

### Evaluation Request

Sent by the Consumer, includes:

- requestedAction
- requestingParty
- requestedTarget

### OpenID4VP Authorization Request

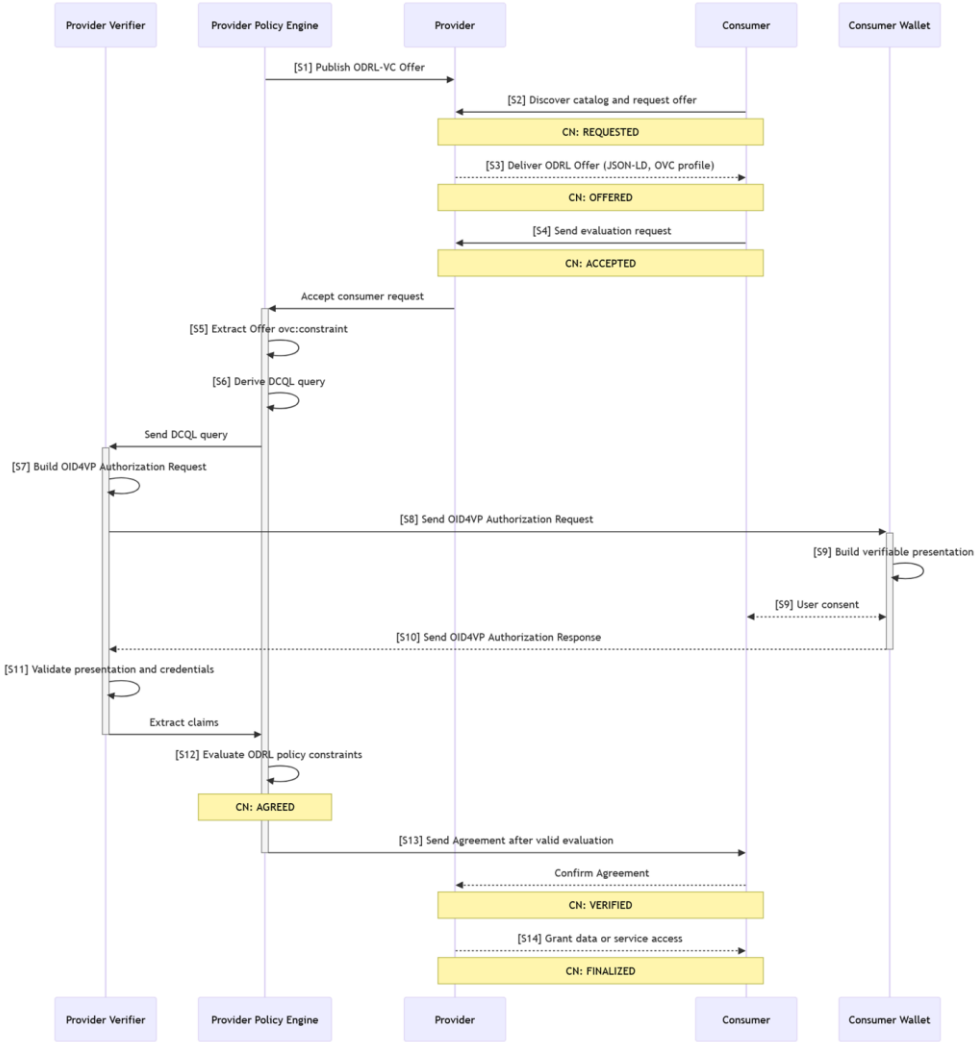
- Carries a dcql_query and a nonce
- Includes the Verifier's client_id

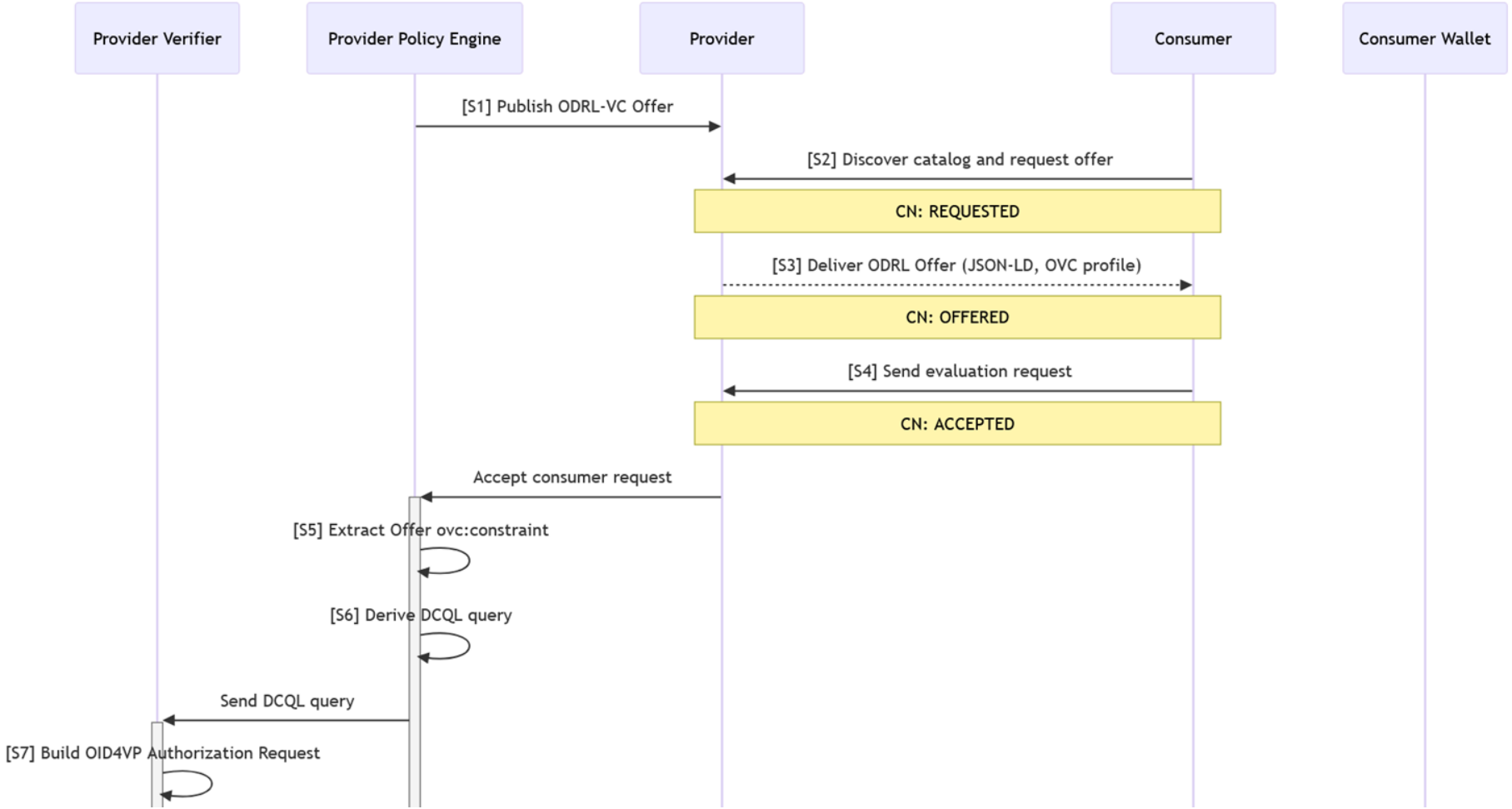
### OpenID4VP Authorization Response

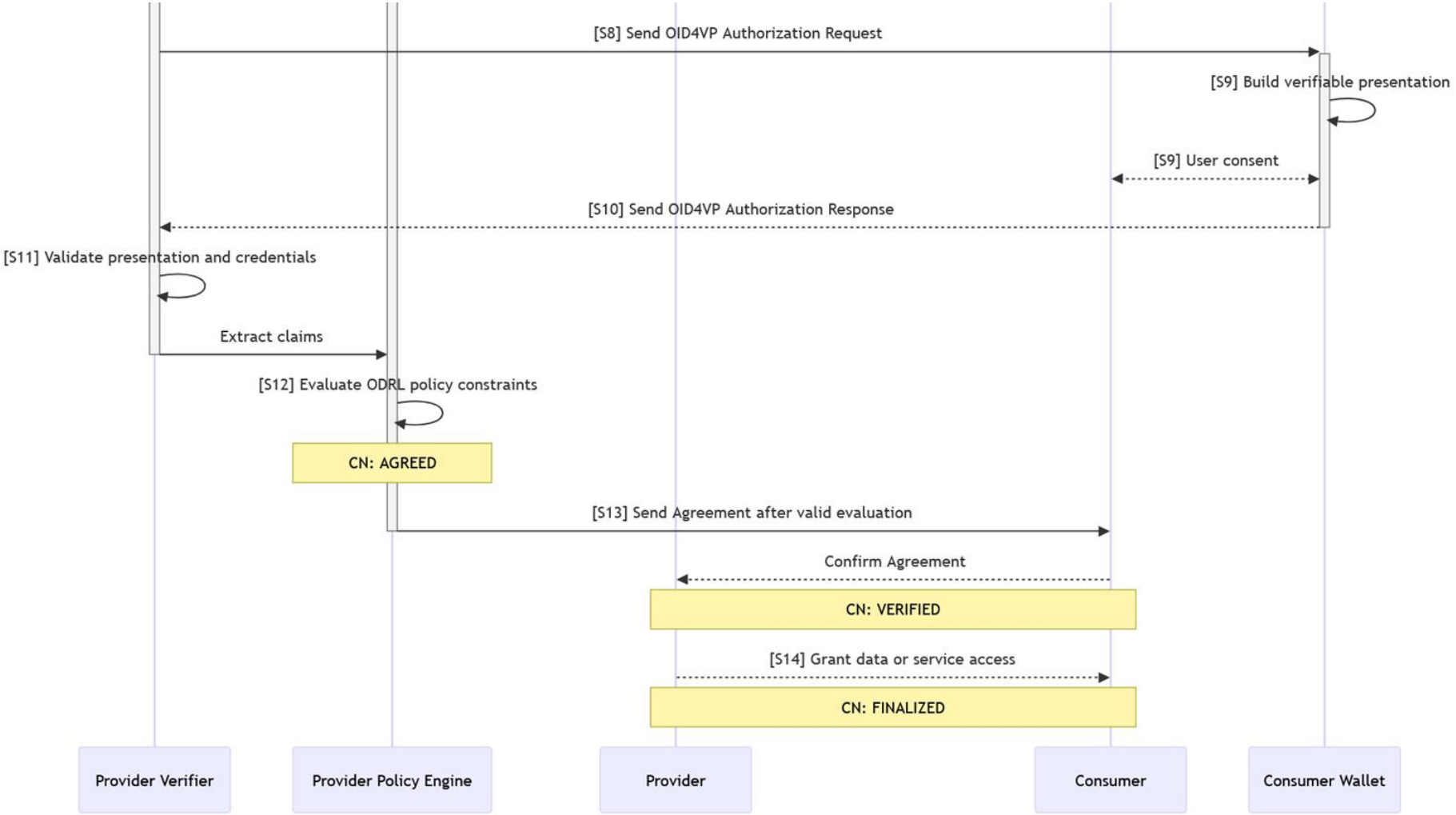
- Carries a signed vp_token
- Bound to the nonce and Verifier audience

### Contract Negotiation State (CNS)

- Represents the current contract negotiation state
- Aligned with Dataspace Protocol negotiation states


Provider Verifier
Provider Policy Engine
Provider
Consumer
Consumer Wallet
[S1] Publish ODRL-VC Offer
[S2] Discover catalog and request offer
CN: REQUESTED
[S3] Deliver ODRL Offer (JSON-LD, OVC profile)
CN: OFFERED
[S4] Send evaluation request
CN: ACCEPTED
Accept consumer request
[S5] Extract Offer ovc:constraint
[S6] Derive DCQL query
Send DCQL query
[S7] Build OID4VP Authorization Request
[S8] Send OID4VP Authorization Request
[S9] Build verifiable presentation
[S9] User consent
[S10] Send OID4VP Authorization Response
[S11] Validate presentation and credentials
Extract claims
[S12] Evaluate ODRL policy constraints
CN: AGREED
[S13] Send Agreement after valid evaluation
Confirm Agreement
CN: VERIFIED
[S14] Grant data or service access
CN: FINALIZED
Provider Verifier
Provider Policy Engine
Provider
Consumer
Consumer Wallet


Provider Verifier
Provider Policy Engine
Provider
Consumer
Consumer Wallet
[S1] Publish ODRL-VC Offer
[S2] Discover catalog and request offer
CN: REQUESTED
[S3] Deliver ODRL Offer (JSON-LD, OVC profile)
CN: OFFERED
[S4] Send evaluation request
CN: ACCEPTED
Accept consumer request
[S5] Extract Offer ovc:constraint
[S6] Derive DCQL query
Send DCQL query
[S7] Build OID4VP Authorization Request


[S8] Send OID4VP Authorization Request
[S9] Build verifiable presentation
[S9] User consent
[S10] Send OID4VP Authorization Response
[S11] Validate presentation and credentials
Extract claims
[S12] Evaluate ODRL policy constraints
CN: AGREED
[S13] Send Agreement after valid evaluation
Confirm Agreement
CN: VERIFIED
[S14] Grant data or service access
CN: FINALIZED
Provider Verifier
Provider Policy Engine
Provider
Consumer
Consumer Wallet

# Conclusion & Future Directions

## KEY CONTRIBUTIONS

### 14-Step Interaction Sequence
Formal protocol integrating VC presentation into DSP contract negotiation states

### 5 ODRL-to-DCQL Mapping Rules
Deterministic derivation of minimal credential requests: satisfying data minimization & determinism

### Policy Examples Validated
Single-credential and multi-credential scenarios illustrated end-to-end

## FUTURE WORK

### Strengthen ODRL-VC Profile
Extend profile to align more closely with DCQL: reducing the translation layer between policy constraints and credential requests

### Governance & Trust Framework Profile
Formalize interaction between trust metadata and ODRL constraints with a companion governance profile

### Reference Implementation & Test Suite
Empirical validation of protocol and conformity across heterogeneous Data Spaces

Standards: ODRL · W3C Verifiable Credentials · ODRL-VC Profile · OpenID4VP · Dataspace Protocol

# Possible inputs for ODRL 3.0

- A deterministic attribute based “query language extraction” integrated to ODRL
- More strict ties between the ODRL Offer / Request and the State of the world
- Common guidelines for protocol best practices
- An ability to define and refer a re-usable “Trust Profile”

# Thank you !

## Get in touch

Yassir SELLAMI
yassir.sellami@gaia-x.eu