Semantic Interoperability

A Key Enabler for Good Quality Distributed Usage Control

Gonzalo Gil | Tekniker | 03/06/2022
Data Sovereignty

“Data sovereignty refers to the self-determination of individuals and organizations with regard to the use of their data”.

Policy Quality

“The problem of assuring the quality of access control policies can be restated as the problem of making sure that the set of policies is consistent, minimal, relevant and complete with respect to the action to be executed by the subjects”.

Distributed Usage Control Challenges

01 DUC Model Expressiveness

02 B2B Policy Implementation

ODRL

IDSA UPL
Wind Energy Use Case

Wind Farm Operator
- Wind Farm Operator
- OEM

Technology Provider

Component Supplier

IDS Connector

IDS Meta Data Exchange

IDSA Data Exchange

Wind Farm

Wind Turbine

Service Provider

Edge Computing

Identity Provider

Vocabulary Provider

Cloud Computing

Sensor Data Owner

Sensor Data Owner

Sensor (Gearbox)

Monitored Data
(Lubrication System)

Health Status
(Gearbox)
Policy Administrator

2022 - 2023

Maintenance

Policy Administrator

"ids.constraint": [ {
  "@type": "ids.Constraint",
  "ids.leftOperand": { "@id": "idsc:POLICY_EVALUATION_TIME" },
  "ids.operator": { "@id": "idsc:DURING" },
  "ids.rightOperand": {
    "@type": "ids.interval",
    "ids.begin": {
      "@type": "ids:Instant",
      "dateTime": {
        "@value": "2022-01-01T00:00:00Z",
        "@type": "xsd:dateTimeStamp"
      }
    },
    "ids.end": {
      "@type": "ids:Instant",
      "dateTime": {
        "@value": "2023-01-01T00:00:00Z",
        "@type": "xsd:dateTimeStamp"
      }
    }
  }
} ]
Policy Analysis

IDSA UPL

Policy Administrator  2022 - 2023

Maintenance

Policy Administrator
"ids:constraint": {
  "ids:leftOperand": {"@id": "idsc:EVENT"},
  "ids:operator": {"@id": "idsc:SAME_AS"},
  "ids:rightOperandReference": {"@id": "idsc:PIP_ENDPOINT"},
  "ids:pipEndpoint": {"@id": "?eventPipURI"}
},

Policy Administrator  2022 - 2023

Policy Administrator

Maintenance
DUC Model Expresiveness

- wfont:gearbox1
  - wfont:lubesystem1
    - wfont:sensor1
      - wfont:meas1
      - wfont:measN
  - wfont:indicators1
    - wfont:ind1
    - wfont:indN
DUC Model Expresiveness
DUC Model Expresiveness

wfont:gearbox1

wfont:lubesystem1

wfont:sensor1

wfont:meas1

wfont:measN

wfont:indicators1

wfont:ind1

wfont:indN

idsc:DURING

idsc:EVENT

2022-01-01T00:00:00Z
xsd:timestamp

2022-07-01T00:00:00Z
xsd:timestamp

?event
DUC Model Expresiveness

©Tekniker 2022

2022-01-01T00:00:00Z
xsd:timestamp

UNUSABLE → INCONSISTENT

idsc:DURING
idsc:EVENT

2022-07-01T00:00:00Z
xsd:timestamp
DUC Model Expresiveness

2022-01-01T00:00:00Z
xsd:timestamp

idsc:DURING

2022-07-01T00:00:00Z
xsd:timestamp
DUC Model Expresiveness

- wfont:gearbox1
- wfont:lubesystem1
- wfont:sensor1
- wfont:meas1
- wfont:measN
- wfont:indicators1
- wfont:ind1
- wfont:indN

idsc:DURING

xsd:timestamp

2022-01-01T00:00:00Z
2022-07-01T00:00:00Z
2024-01-01T00:00:00Z

© Tekniker 2022
B2B Policy Implementation
Thank you very much!
Gonzalo Gil Inchaurza
gonzalo.gil@tekniker.es