Interactive: Usage control realized by experts
Jörg Langkau

The experts in secure, global data communications.
Interactive: Jörg Langkau trying to understand what usage control is, by designing some constraints with the help of binary operators.

The experts in secure, global data communications.
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C1

P1

C2

P2

IdP (CA)

Security Token

DAPS

Security Token
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Connect

C₁
SECURITY TOKEN

BROKER

C₂
SECURITY TOKEN

DAPS

IdP (CA)

P₁

P₂
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Provider C1

Consumer C2

Data + sticky usage control Policy

P1

P2

BROKER

DAPS

IdP (CA)

SECURITY TOKEN

SECURITY TOKEN
Open Digital Rights Language

```json
{
    "@context": "http://www.w3.org/ns/odrl.jsonld",
    "@type": "Offer",
    "uid": "http://example.com/policy:3333",
    "profile": "http://example.com/odrl:profile:02",
    "permission": [
        {
            "target": "http://example.com/asset:3333",
            "action": "display",
            "assigner": "http://example.com/party:0001"
        }
    ]
}
```

https://www.w3.org/TR/odrl-model/#constraint-class
A usage control expressed in ODRL

```json
{
    "@context": "http://www.w3id.org/ids/contract.jsonld",
    "@type": "ids:ContractAgreement",
    "uid": "http://example.org/policy#use-data-but-pay",
    "permission": {
        "target": "http://example.com/OEM/connector/ProductionPlans/",
        "action": "use"
    }
}
```

https://industrialdataspace.jiveon.com/docs/DOC-2264
https://www.w3.org/TR/odrl-model/#constraint
{  
  "@context": "http://www.w3.org/ns/odrl.jsonld",
  "@type": "Offer",
  "uid": "http://example.com/policy:6163",
  "profile": "http://example.com/odrl:profile:10",
  "permission": [  
    {  
      "target": "http://example.com/document:1234",
      "assigner": "http://example.com/org:616",
      "action": "distribute",
      "constraint": [{  
        "leftOperand": "dateTime",
        "operator": "lt",
        "rightOperand": {  
          "@value": "2018-01-01",
          "@type": "xsd:date"
        }
      }
    ]
  ]
}

https://www.w3.org/TR/odrl-model/#constraint-class
Relation | Inverse
---|---
Before($i,j$) | After($j,i$)
Meets($i,j$) | MetBy($j,i$)
Overlaps($i,j$) | OverlappedBy($j,i$)
Starts($i,j$) | StartedBy($j,i$)
During($i,j$) | Contains($j,i$)
Finishes($i,j$) | FinishedBy($j,i$)
Equals($i,j$) | Equals($j,i$)

https://www.w3.org/TR/owl-time/
motic® decide „Context time II“

<table>
<thead>
<tr>
<th>i</th>
<th>j</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before(i, j)</td>
<td>After(j, i)</td>
</tr>
<tr>
<td></td>
<td>MetBy(j, i)</td>
</tr>
<tr>
<td>Meets(i, j)</td>
<td></td>
</tr>
<tr>
<td>Overlaps(i, j)</td>
<td>OverlappedBy(j, i)</td>
</tr>
<tr>
<td>Starts(i, j)</td>
<td>StartedBy(j, i)</td>
</tr>
<tr>
<td>During(i, j)</td>
<td>Contains(j, i)</td>
</tr>
<tr>
<td>Finishes(i, j)</td>
<td>FinishedBy(j, i)</td>
</tr>
<tr>
<td>Equals(i, j)</td>
<td>Equals(j, i)</td>
</tr>
</tbody>
</table>

geom:overlaps

https://github.com/nicosResearchAndDevelopment/nrd-motic/blob/master/decide/operator/README.md#geomoverlaps-1
Paris geos:inside France === true

...and: geo-fences also!
Web Access Control (WAC by W3C)

https://www.w3.org/wiki/WebAccessControl
foaf:memberOf

A person is member of something, a IDS-Connector is meber of something.

foaf:hasMember

A group has members. A´role has members.

org:hasSubOrganization

org:hasUnit

org:hasSite
motic® decide „Context membership III (organization)“

https://www.w3.org/TR/vocab-org/
net:inside(["178.10.10.42"], ["178.10.10.1", "178.10.10.255"])) === true

…and, very “experimental” context ‘identifier’:

id:startsWith("C8-5B-76-B5-43-2B", "C8-5B-76") === true

Policy enforcement: Not only to describe data sovereignty in a declarative way and thus to make it interpretable for a computer (which is already an important step), but to be able to technically enforce data sovereignty (enforcement), is a central point of the whole IDS initiative. IDSA pursues various technology development strands (which already existed before IDS was established and which are independent concepts in themselves), including distributed usage control, data provenance tracking and sticky policies.

motic® decide „enforcement I, handle a policy“

Some resources

Information Model - Usage Policy Language - ODRL Reference

https://industrialdataspace.jiveon.com/docs/DOC-1708

IDS Usage Policy Language

https://industrialdataspace.jiveon.com/docs/DOC-2264

"Usage Control in the Industrial Data Space 2.0"
motic® decide: makes the right decision!

…and: thank you!!!