

Semantic Interoperability

# A Key Enabler for Good Quality Distributed Usage Control

Gonzalo Gil | Tekniker | 03/06/2022

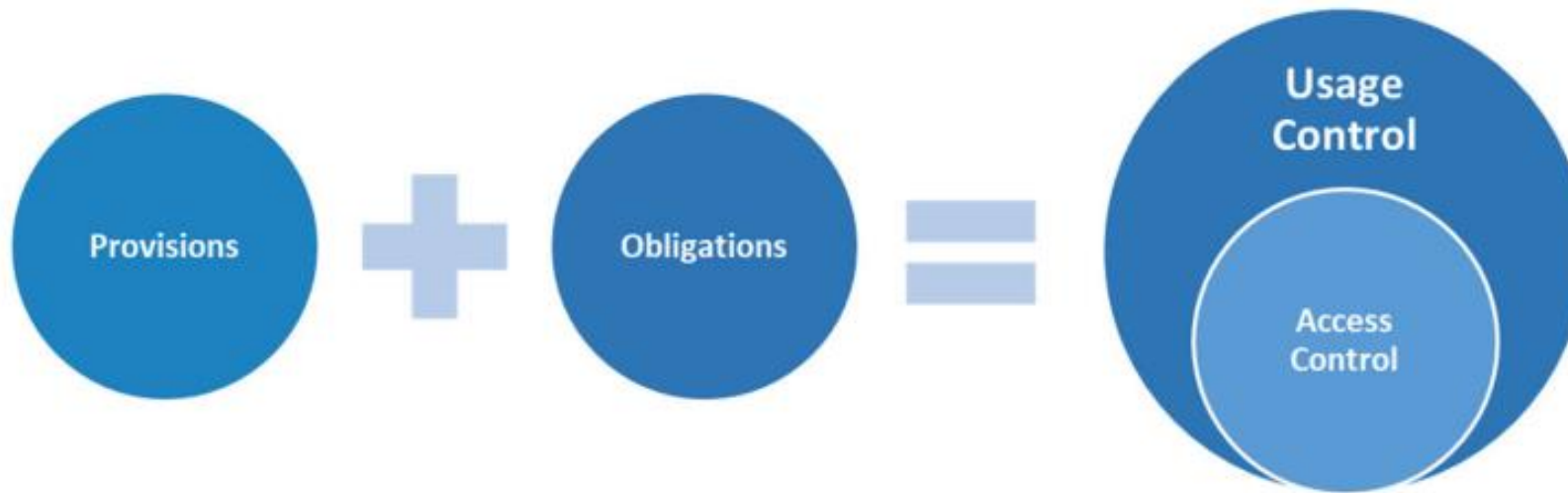




# Data Sovereignty

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

Jarke, M., Otto, B. & Ram, S. Data Sovereignty and Data Space Ecosystems. *Bus Inf Syst Eng* 61, 549–550 (2019).  
<https://doi.org/10.1007/s12599-019-00614-2>





# 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”.*



Elisa Bertino, Amani Abu Jabal, Seraphin Calo, Dinesh Verma, and Christopher Williams.  
2018. The Challenge of Access Control Policies Quality. J. Data and Information  
Quality 10, 2, Article 6 (July 2018), 6 pages. <https://doi.org/10.1145/3209668>



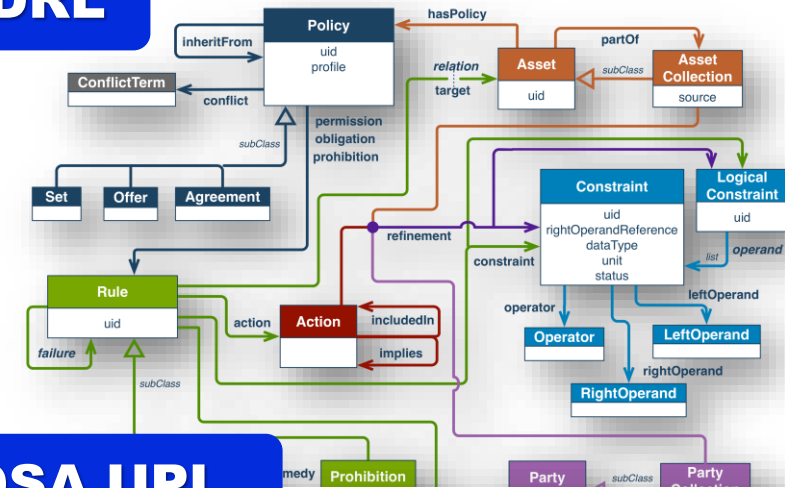


# Distributed Usage Control Challenges

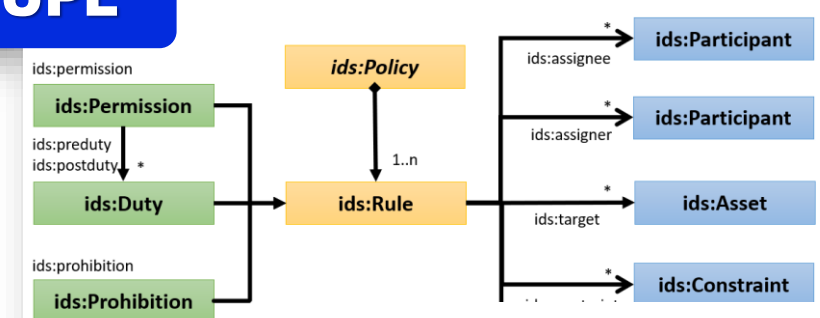
## 01 DUC Model Expressiveness

## 02 B2B Policy Implementation

### ODRL



### IDSA UPL



# Wind Energy Use Case



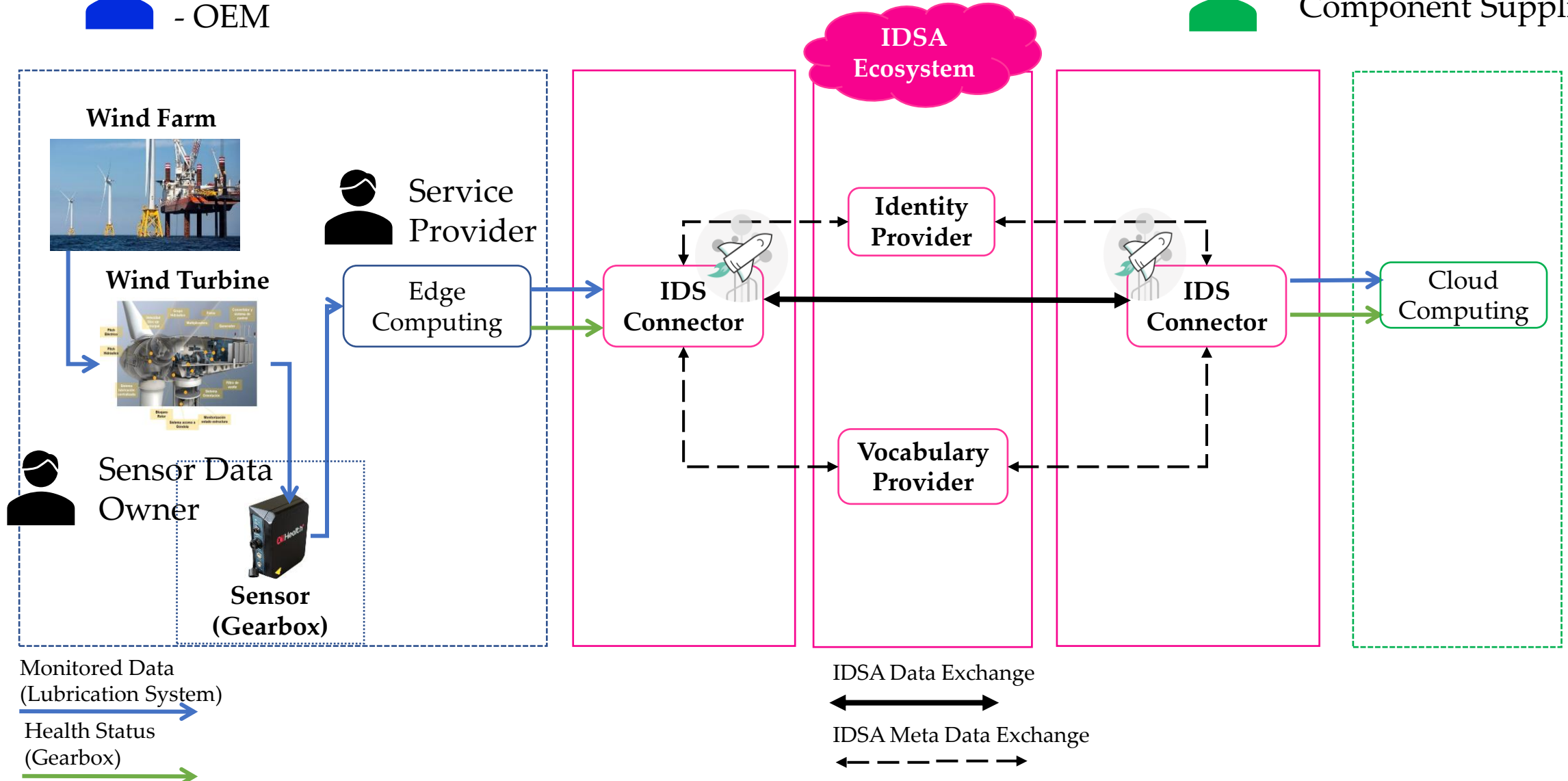
- Wind Farm Operator  
- OEM



Technology Provider



Component Supplier



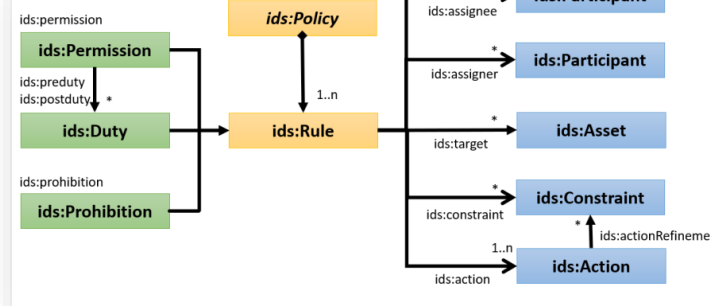


2022 - 2023

Maintenance

# Policy Analysis

IDSA UPL





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 Administrator

2022 - 2023

Maintenance

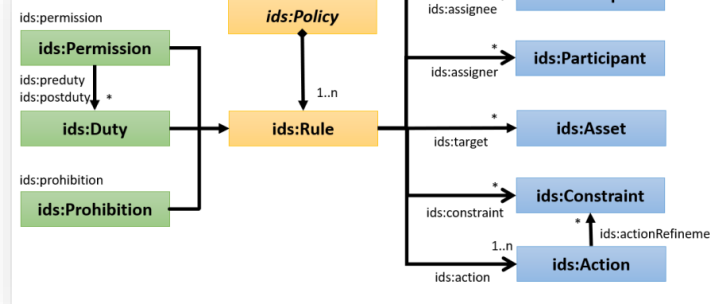
Policy Administrator



## Policy Analysis

IDSA UPL

```
"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 Administrator

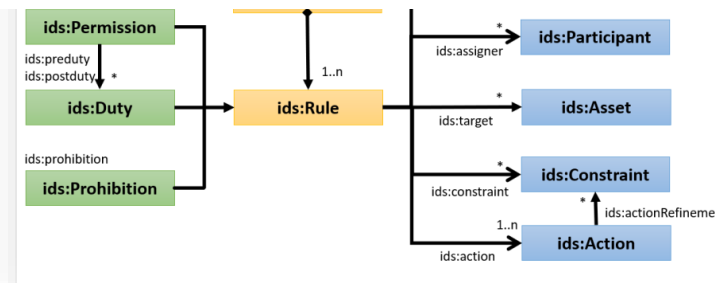
2022 - 2023

Maintenance

Policy Administrator

```
"ids:constraint": [{
  "ids:leftOperand": {"@id": "idsc:EVENT"},
  "ids:operator": {"@id": "idsc:SAME_AS"},
  "ids:rightOperandReference": {"@id":
  "ids:pipEndpoint": {"@id": "?eventPipURI"}
}
```

```
"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 Administrator



Maintenance

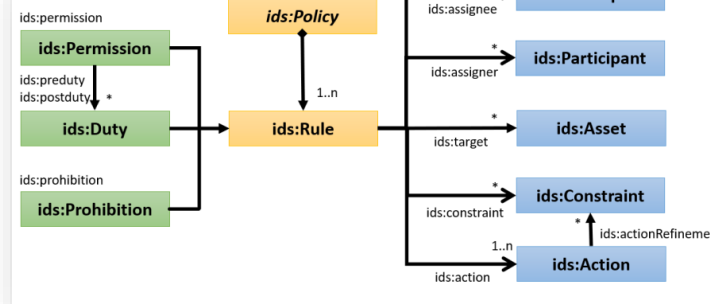
Policy Administrator



## Policy Analysis

IDSA UPL

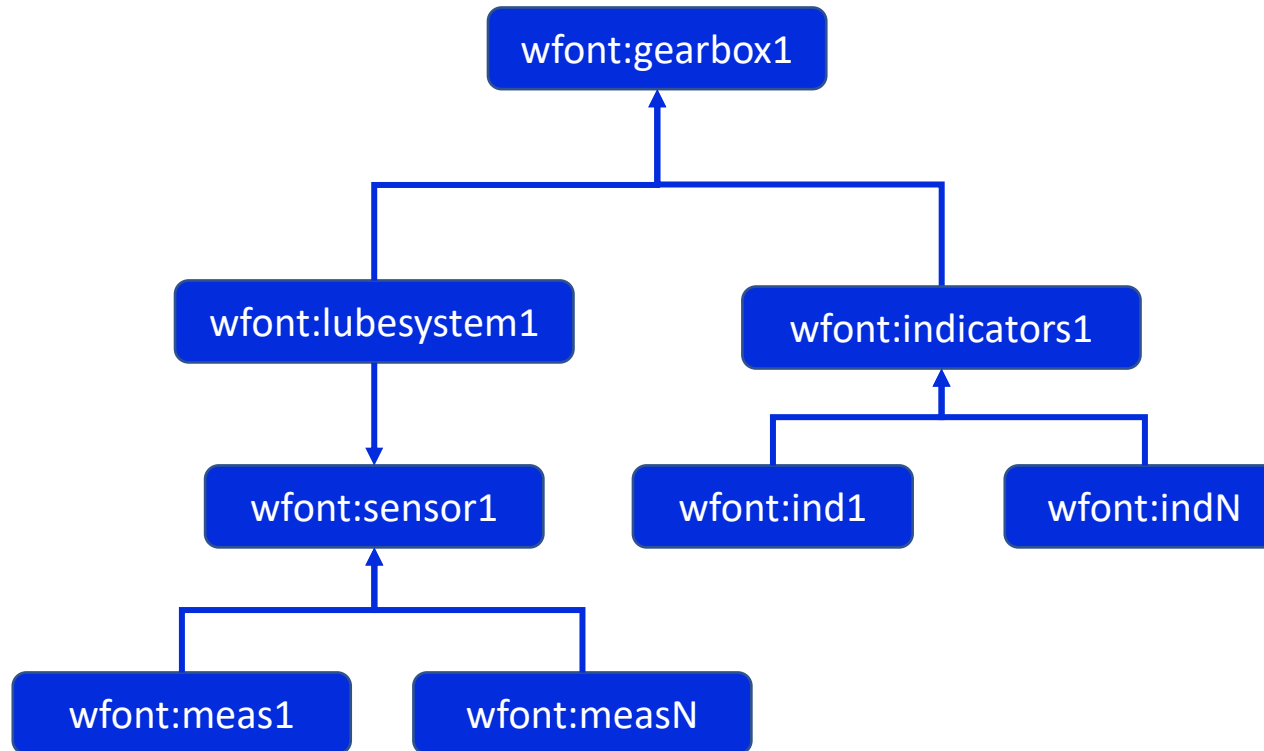
```
"ids.constraint": [{
  "@type": "ids.Constraint",
  "ids.leftOperand": {"@id": "idsc:POLICY_EVALUATION_TIME"},
  "ids.operator": {"@id": "idsc:DURING"},
  "ids.rightOperand": {
    "@type": "ids.Interval",
    "ids.begin": {
      "@type": "ids.Instant",
      "dateTime": {
        "@value": "2022-01-01T00:00:00Z",
        "@type": "xsd:dateTimeStamp"
      }
    },
    "ids.end": {
      "@type": "ids.Instant",
      "dateTime": {
        "@value": "2023-01-01T00:00:00Z",
        "@type": "xsd:dateTimeStamp"
      }
    }
  }
},
{
  "@type": "ids.Constraint",
  "ids.leftOperand": {"@id": "idsc:EVENT"},
  "ids.operator": {"@id": "idsc:SAME_AS"},
  "ids.rightOperandReference": {"@id": "maintenance"},
  "ids.pipEndpoint": {"@id": "?eventPipURI"}
}
]
```



```
ids.constraint : {
  "ids.leftOperand": {"@id": "idsc:EVENT"},
  "ids.operator": {"@id": "idsc:SAME_AS"},
  "ids.rightOperandReference": {"@id": "maintenance"},
  "ids.pipEndpoint": {"@id": "?eventPipURI"}
}
```

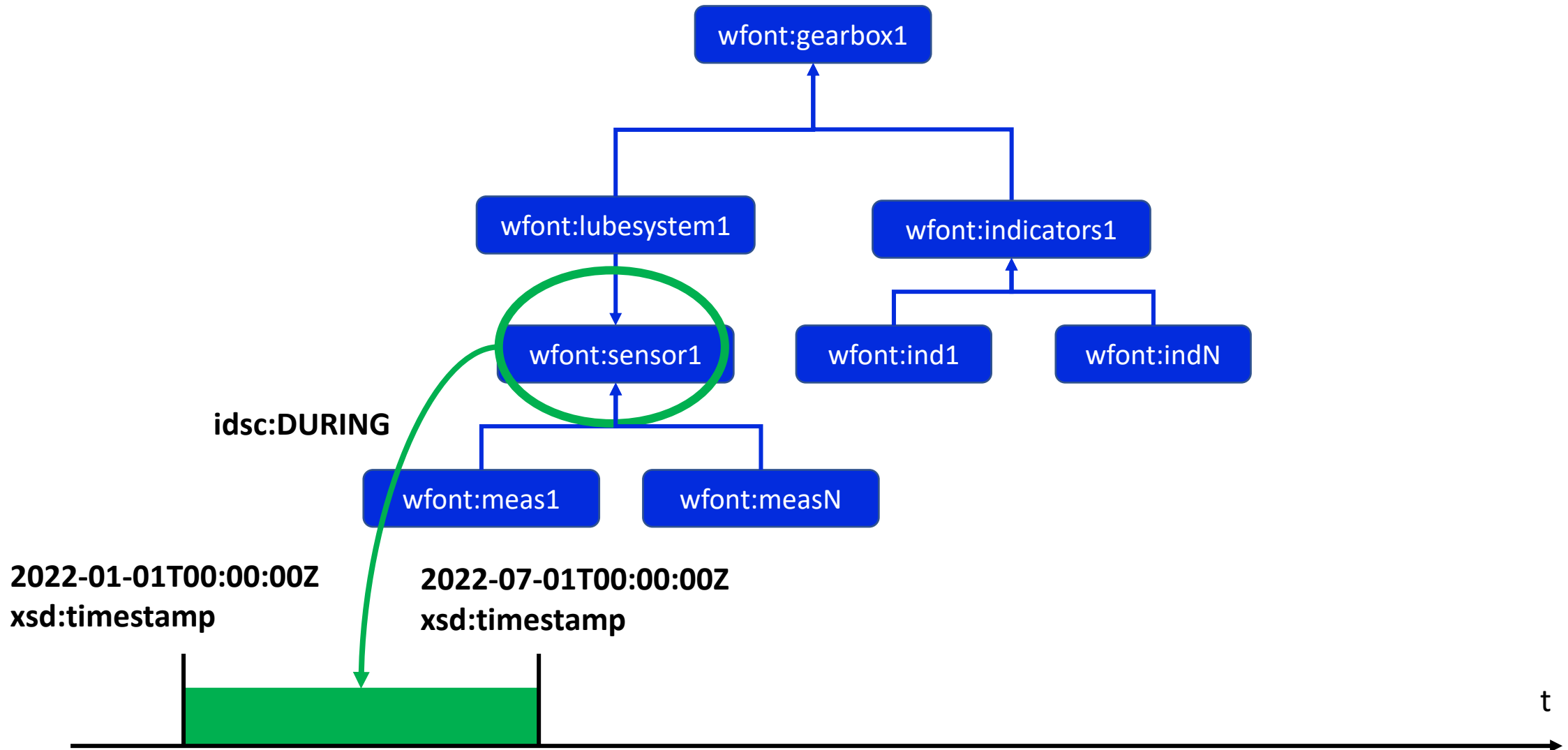


# DUC Model Expressiveness



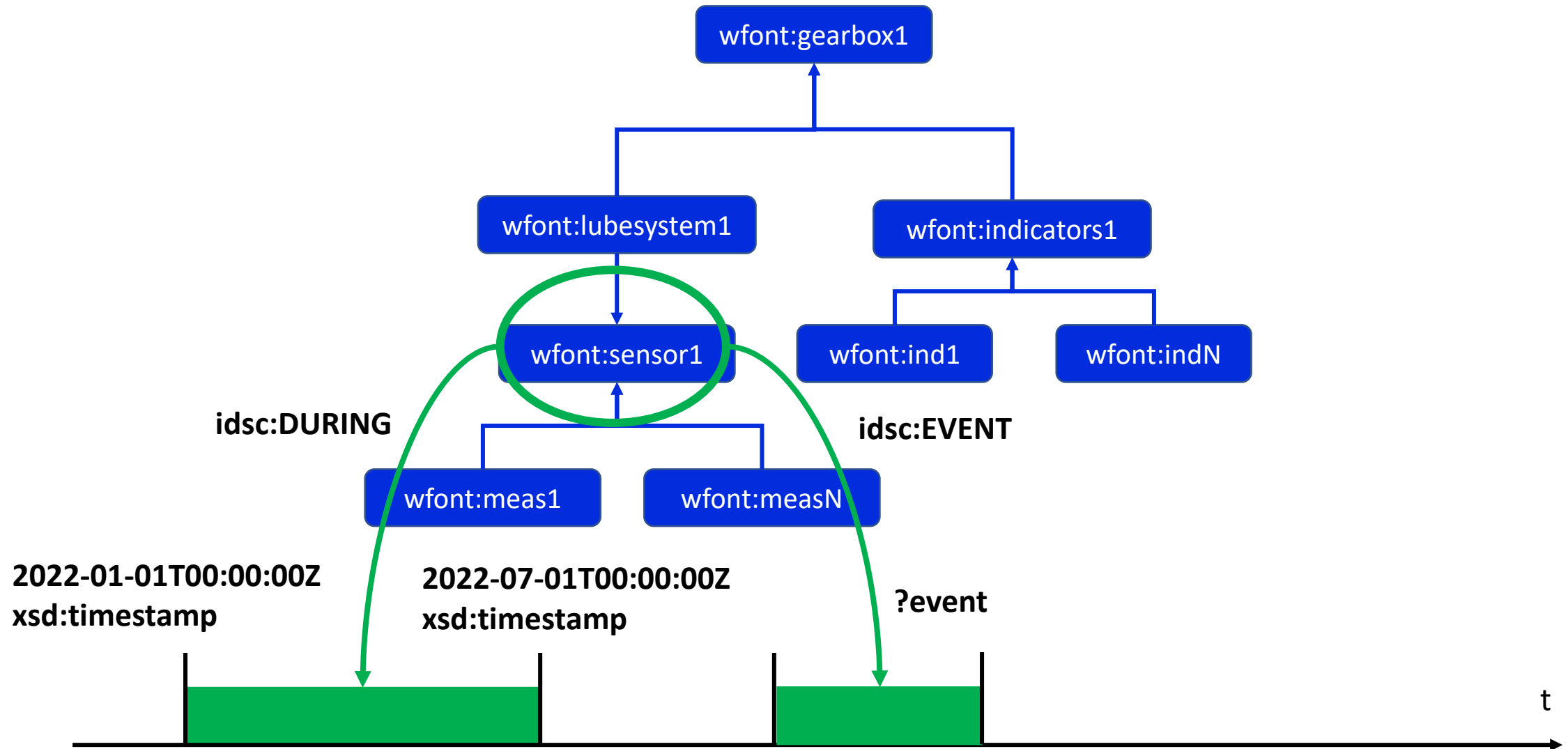


# DUC Model Expressiveness





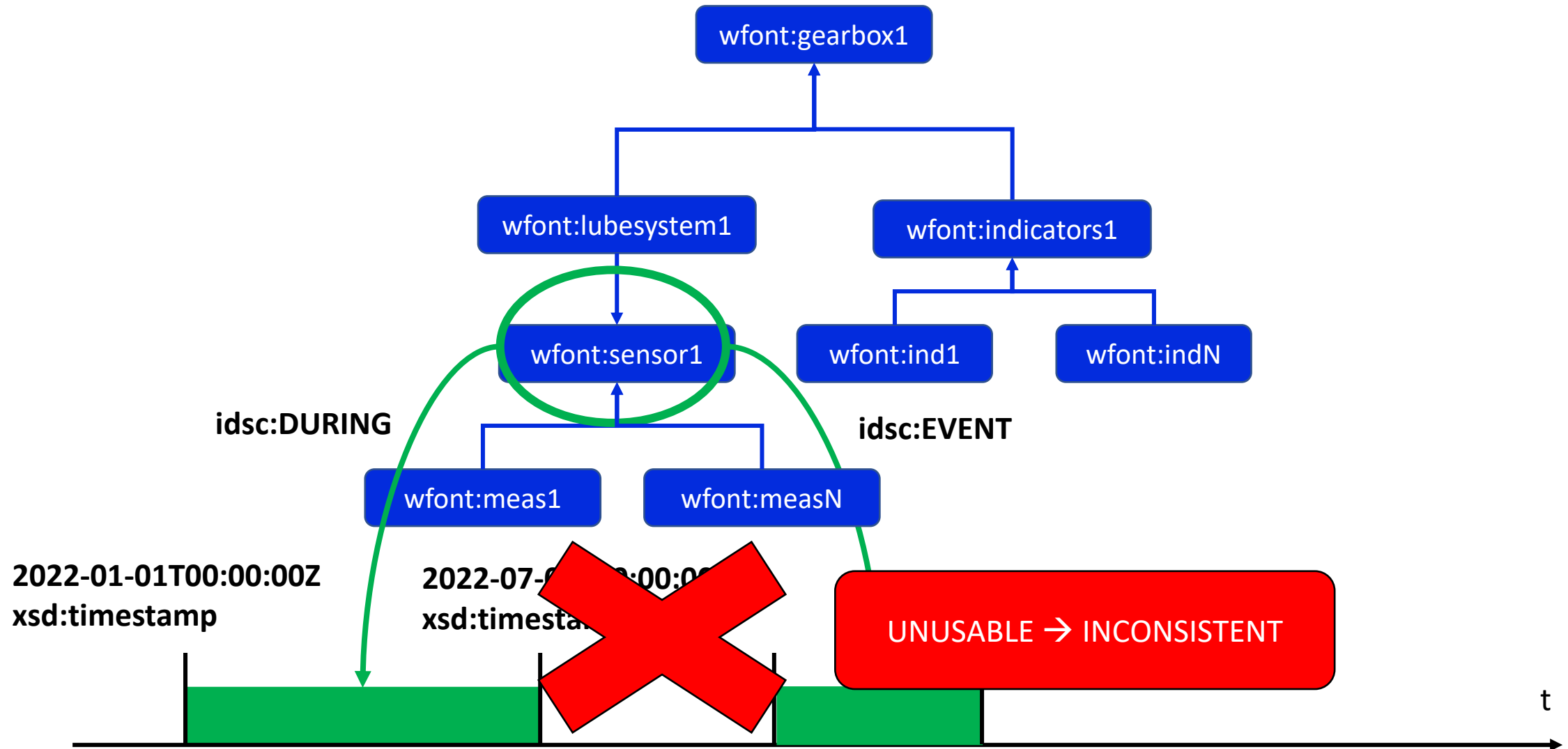
# DUC Model Expressiveness





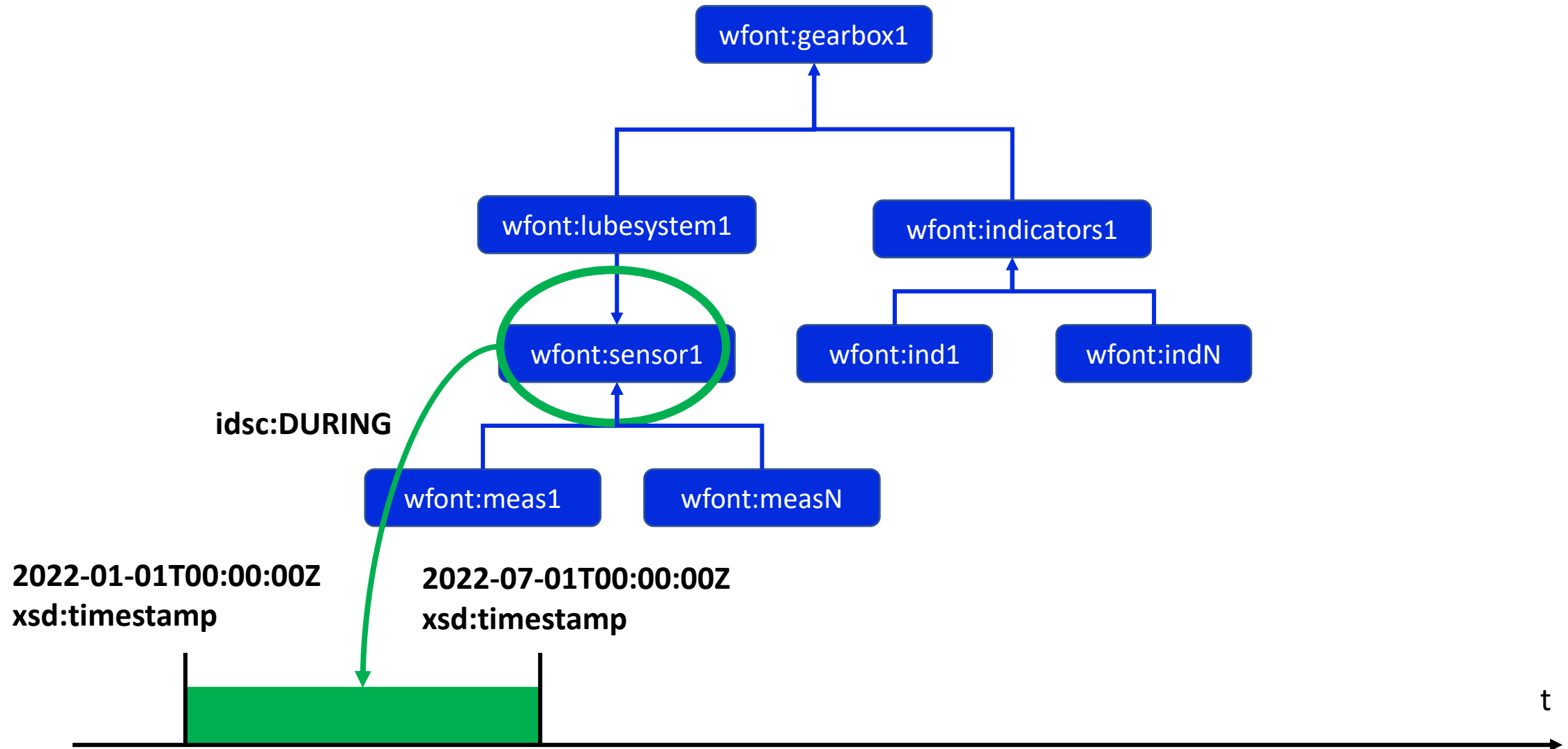


# DUC Model Expressiveness



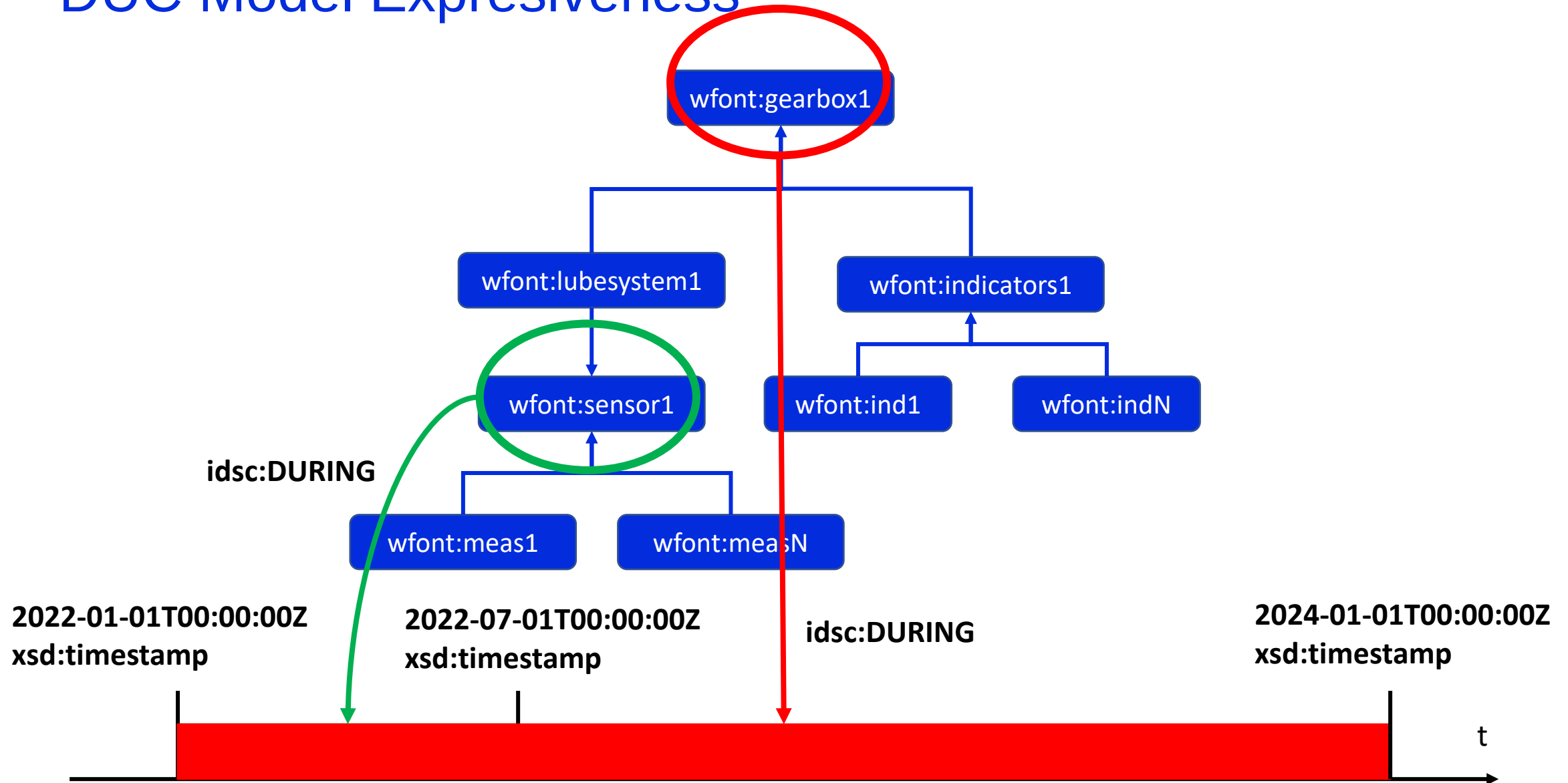


# DUC Model Expressiveness



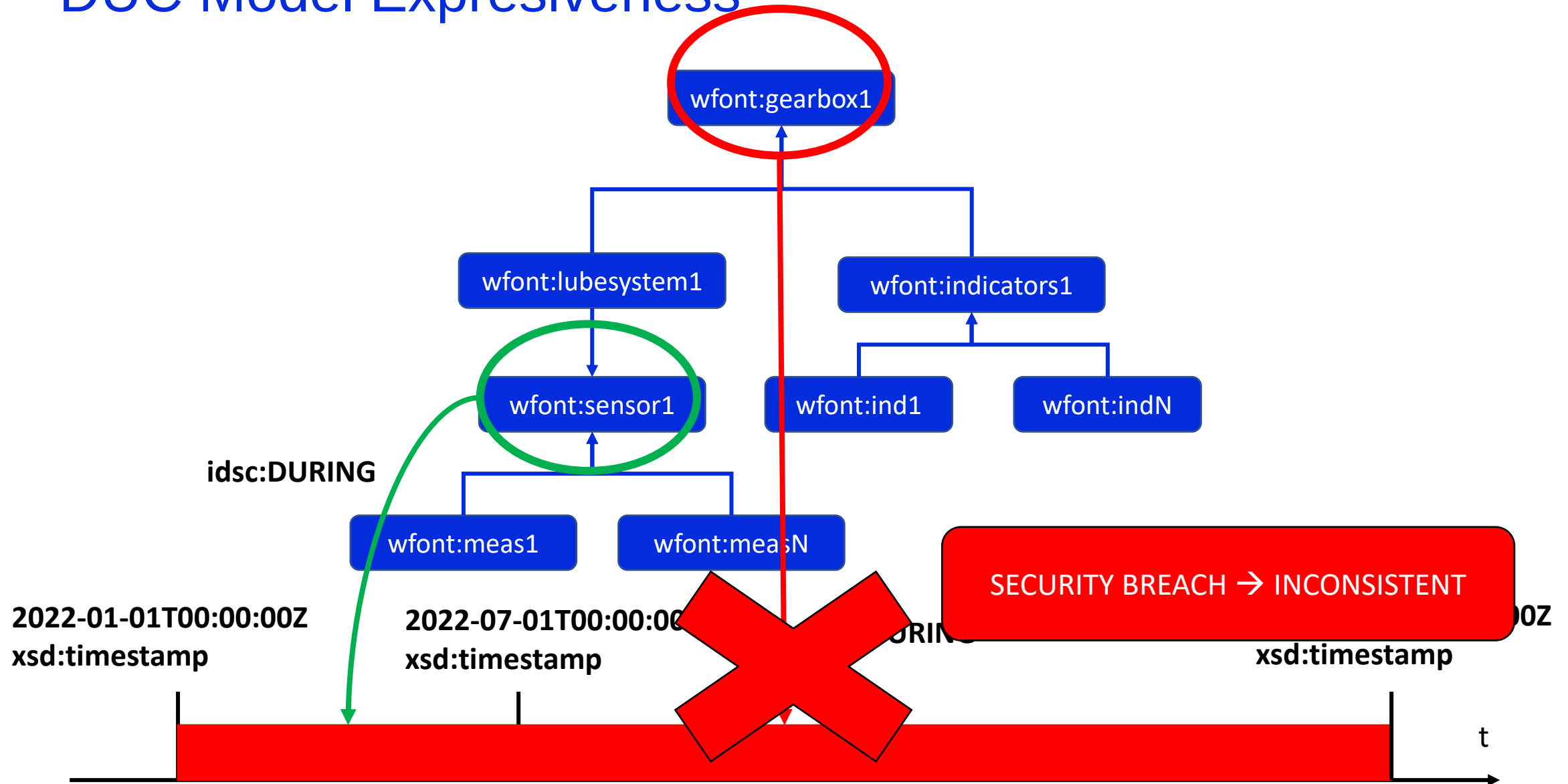


# DUC Model Expressiveness



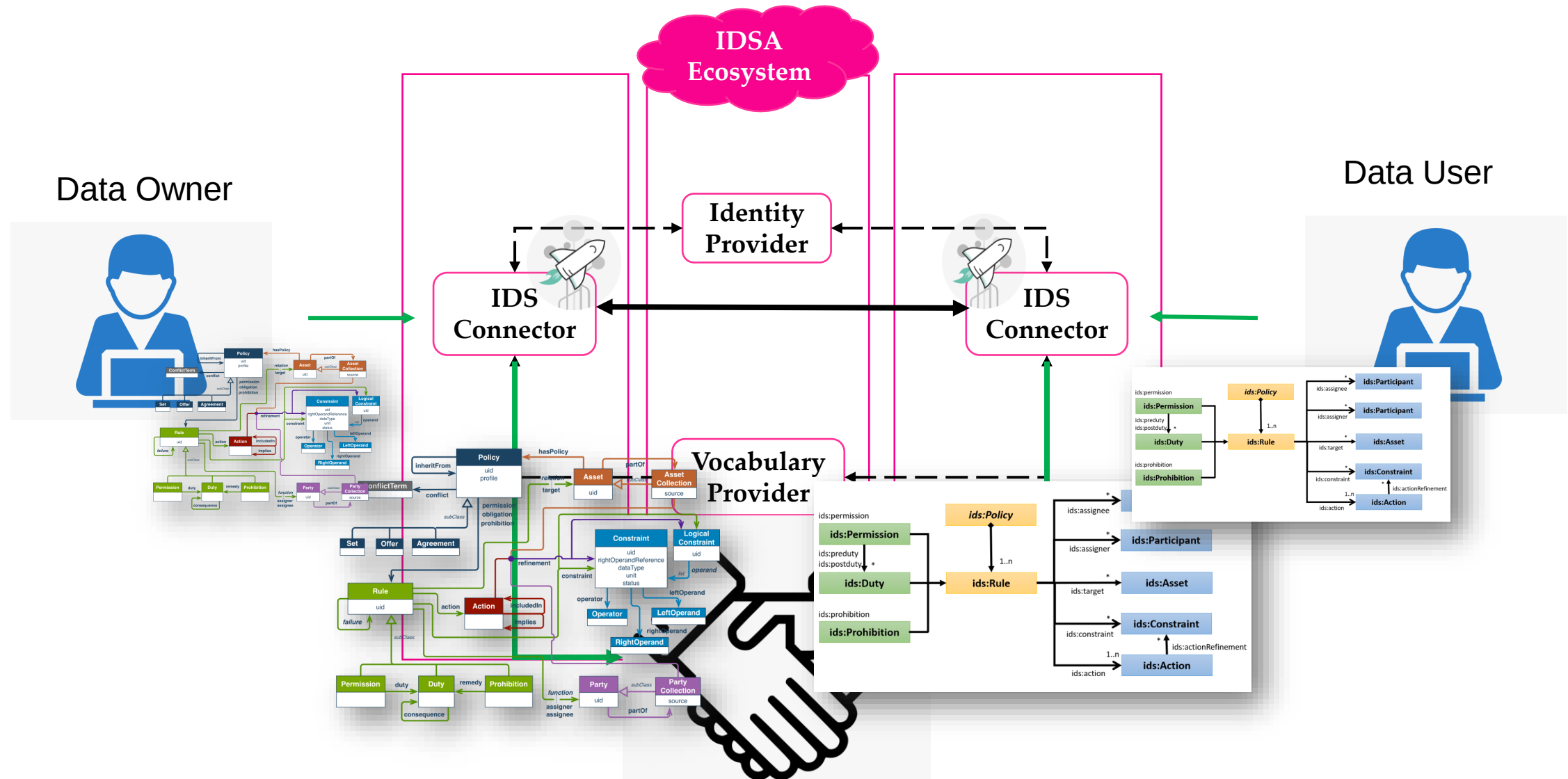


# DUC Model Expressiveness





# B2B Policy Implementation





**Thank you very much!**

**Gonzalo Gil Inchaurrea**  
[gonzalo.gil@tekniker.es](mailto:gonzalo.gil@tekniker.es)



Tekniker  
Parke Teknologikoa  
C/ Iñaki Goenaga, 5  
20600 Eibar (Gipuzkoa)  
Tel: +34 943 20 67 44  
[www.tekniker.es](http://www.tekniker.es)