



TOWARDS AN INTEROPERABLE DEVICE PROFILE CONTAINING RICH USER CONSTRAINTS

Cédric Dromzée
LIUPPA / AEXIUM SAS
29 rue des Pins
F-40230 Saubion
dromzee@aexium.com

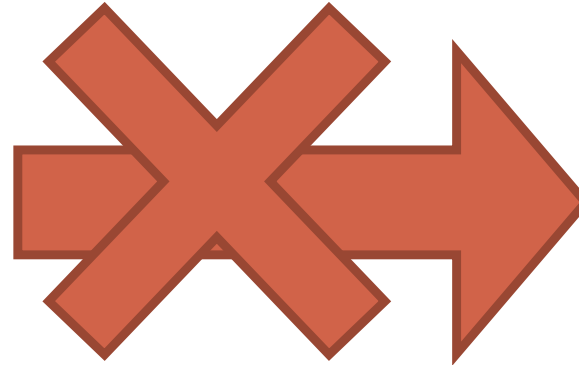
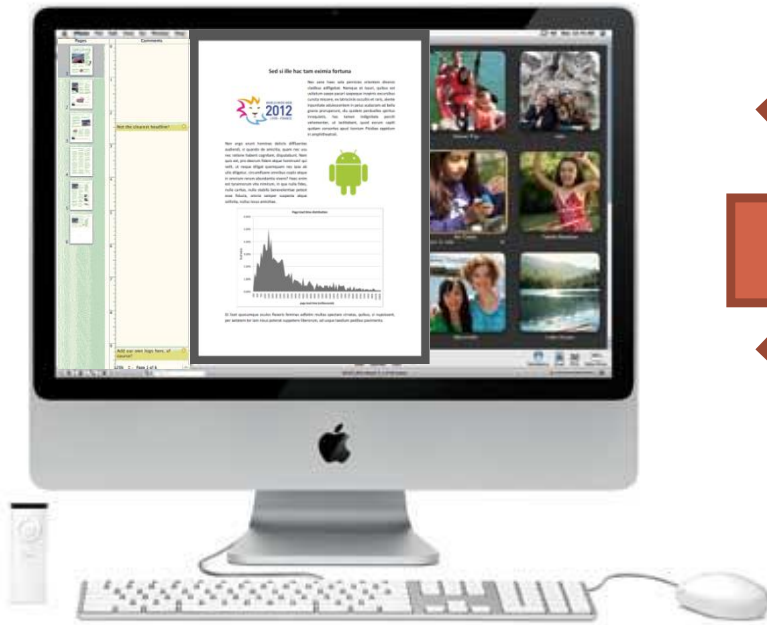
Sébastien Laborie
LIUPPA/T2i – University of Pau
2, Allée du Parc Montauray
F-64600 Anglet
Sebastien.Laborie@univ-pau.fr

Philippe Roose
LIUPPA/T2i - University of Pau
2, Allée du Parc Montauray
F-64600 Anglet
Philippe.Roose@univ-pau.fr



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HETEROGENEOUS ENVIRONMENTS



Device heterogeneity



Document heterogeneity



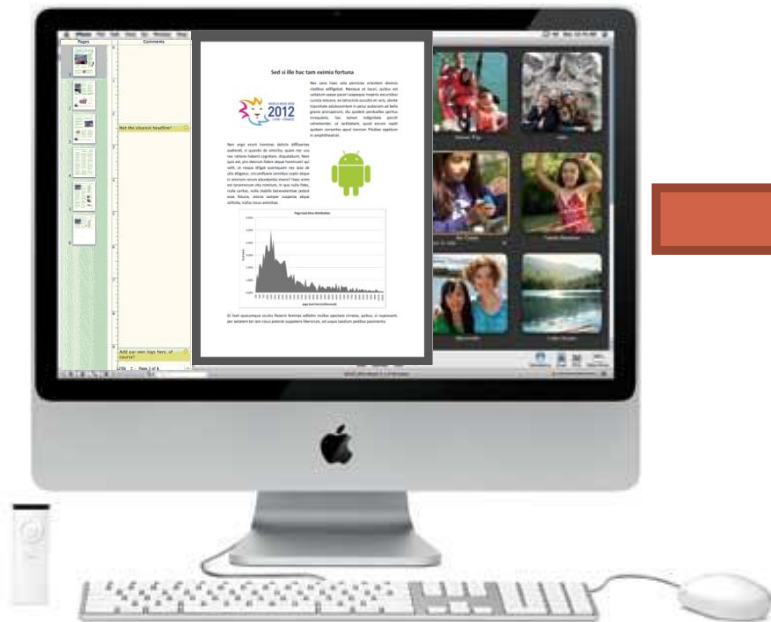
Execution context



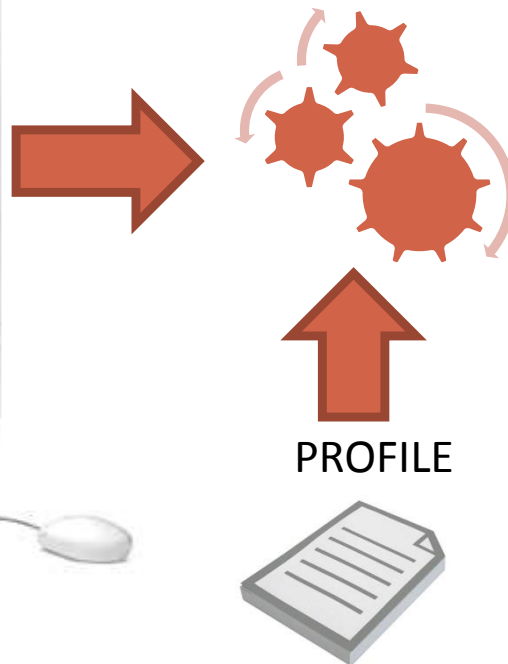
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PROFILE

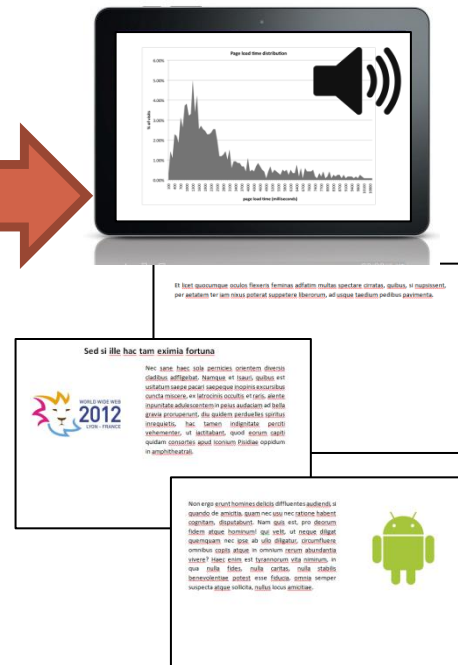
ORIGINAL DOCUMENT



ADAPTATION PHASE



ADAPTED DOCUMENT



Limitations:

- Adaptation “implicit”
- No portability
- No genericity
- No explicit constraints

Our proposition

SEMANTIC GENERIC PROFILE (SGP)

CONTEXT & PROBLEMS

1. RELATED WORK

2. FACETS AND CONSTRAINTS

3. THE SEMANTIC GENERIC PROFILE (SGP)

4. DEMO

5. FUTURE WORK

6. CONCLUSION



RELATED WORK

Profile modeling approaches

- CC/PP - Composite Capability / Preference Profiles
- UAProf
- CSCP Comprehensive Structured Context Profiles
- Context-ADDICT
- WURFL Wireless Universal Resource File
- SPICE Service Platform for Innovative Communication Environment
- PPDL Pervasive Profile Description Language
- CCML Centaurus Capability Markup Language
- E²R
- MAGNET Beyond

LIMITS

Profile structures tend to be:

- Not extensible (yet their vocabulary needs extending)
- Domain specific (limited to one set of aspects of the context)
- Purely descriptive:
 - screen resolution, CPU Power, codecs...
- Lacking in richness (not explicit constraints):
 - no sound if the ambient noise level is high

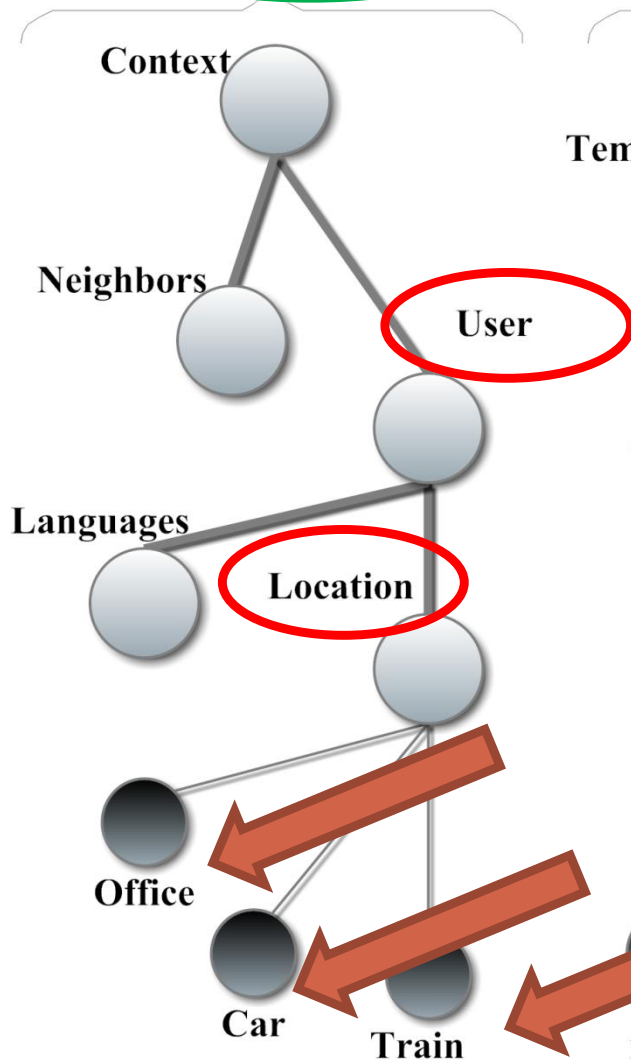


FACETS AND CONSTRAINTS

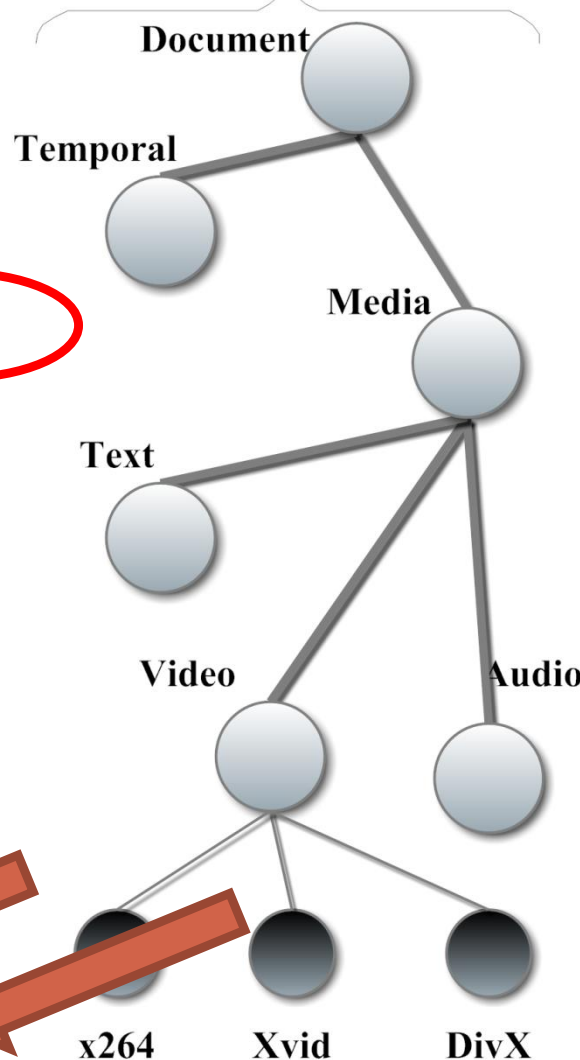
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Multi-Facet

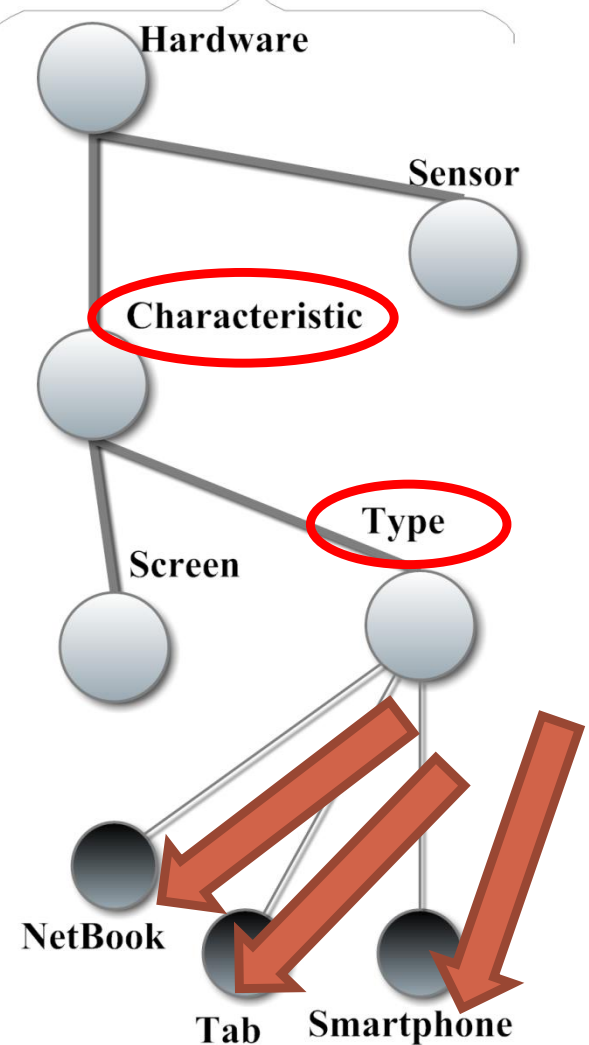
Contextual facet

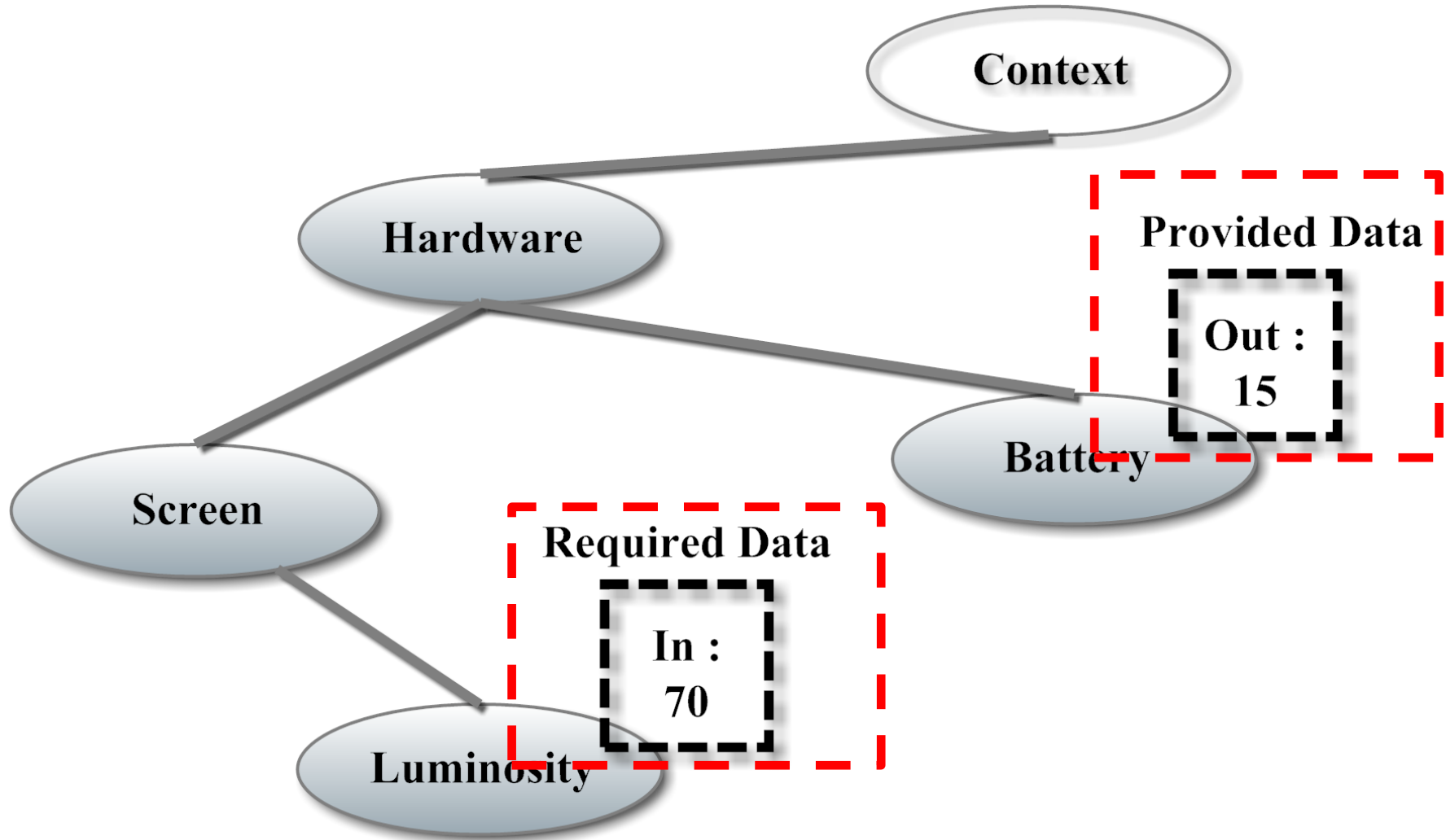


Document facet

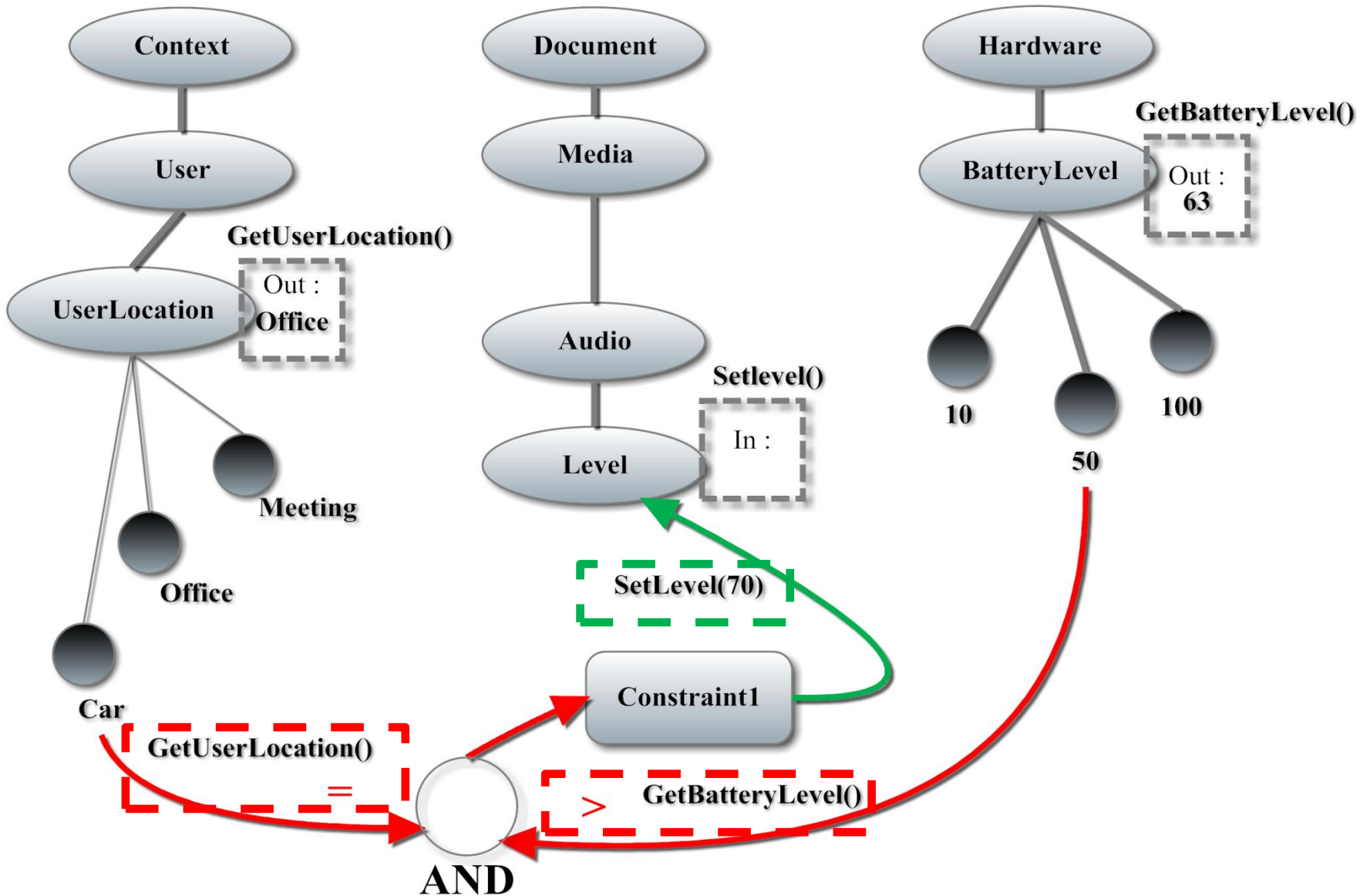


Hardware Facet

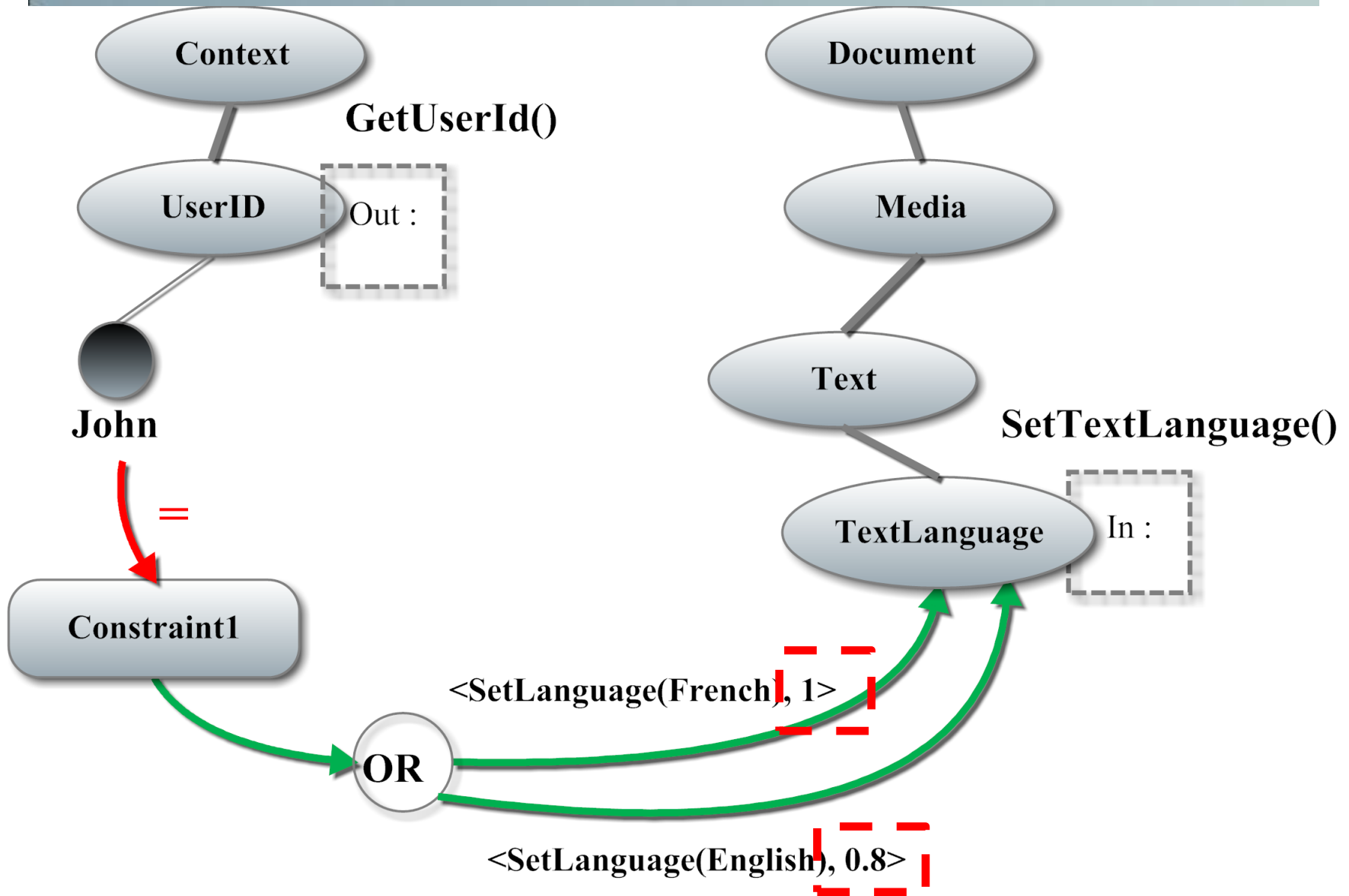




CONSTRAINTS



CONSTRAINTS WITH PRIORITIES

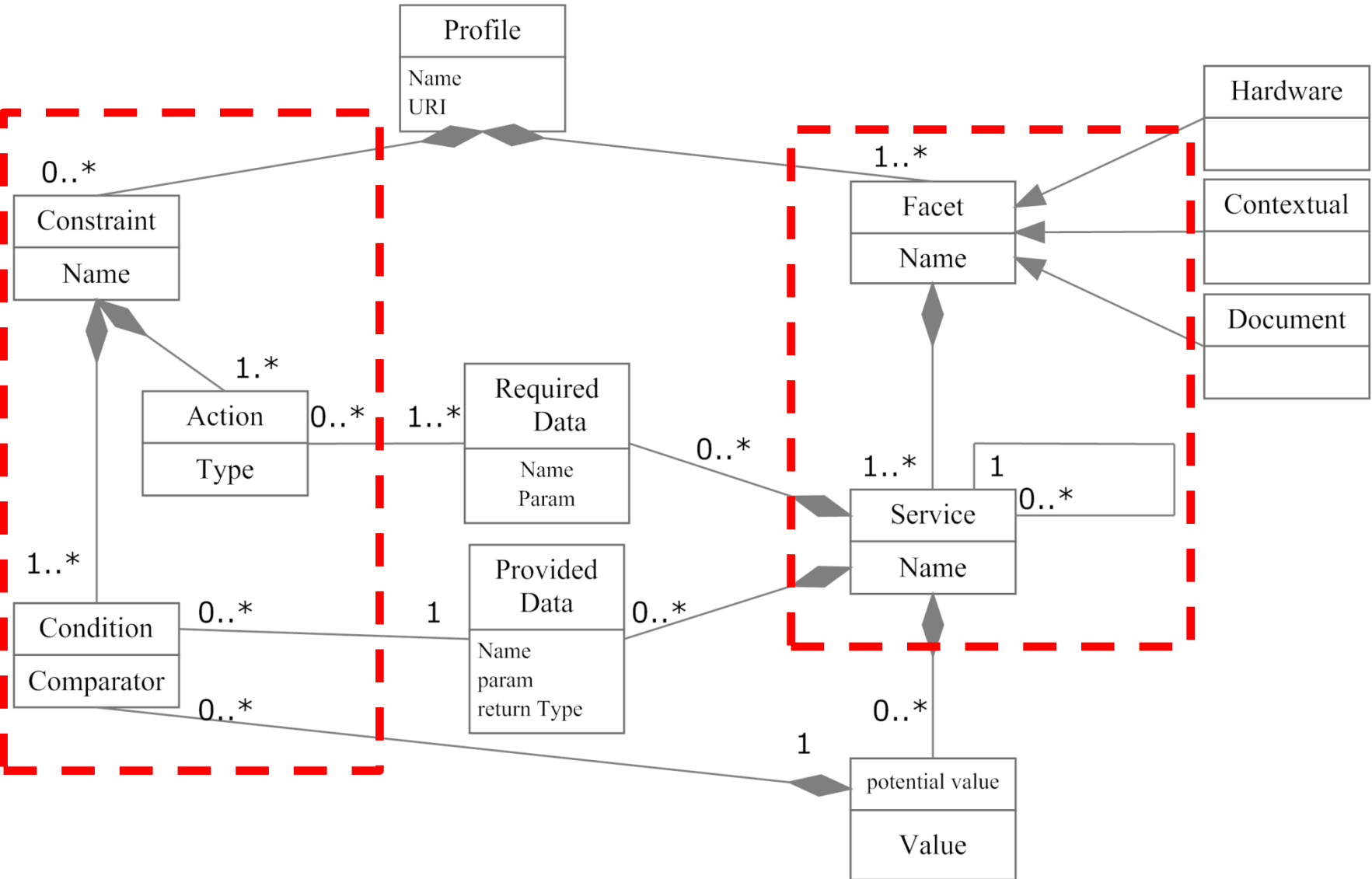




THE SEMANTIC GENERIC PROFILE

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UML modeling of our Semantic Generic Profile (SGP)



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SGP profiles encoded in RDF/XML

```
<?xml version="1.0"?>
<rdf:RDF xmlns:sgp="http://SGP#" xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#">
  <sgp:Profile rdf:about="http://SGP#Profil_1">
    <sgp:name>John's profile</sgp:name>
    <sgp:describes>
      <sgp:Facet rdf:about="http://SGP#Hardware">
        <sgp:contains>
          <sgp:Service rdf:about="http://SGP#Screen">
            <sgp:contains>
              <sgp:Service rdf:about="http://SGP#ScreenResolution">
                <sgp:in>
                  <sgp:InputFunction rdf:about="http://SGP#SetScreenResolution">
                    <sgp:param rdf:datatype="http://www.w3.org/2001/XMLSchema#string"/>
                  </sgp:InputFunction>
                </sgp:in>
                <sgp:out>
                  <sgp:OutputFunction rdf:about="http://SGP#GetScreenResolution">
                    <sgp:return rdf:datatype="http://www.w3.org/2001/XMLSchema#string"/>
                  </sgp:OutputFunction>
                </sgp:out>
              </sgp:Service>
            </sgp:contains>
            <sgp:contains>
              <sgp:Service rdf:about="http://SGP#ScreenLuminosity">
                <sgp:in>
                  <sgp:InputFunction rdf:about="http://SGP#SetScreenLuminosity">
                    <sgp:param rdf:datatype="http://www.w3.org/2001/XMLSchema#string"/>
                  </sgp:InputFunction>
                </sgp:in>
              </sgp:Service>
            </sgp:contains>
          </sgp:Service>
        </sgp:contains>
      </sgp:Facet>
    </sgp:describes>
  </sgp:Profile>
</rdf:RDF>
```

WHY RDF ?

- Resource Description Framework (RDF)
- W3C Standard, 2004
- Semantic Web Technologies
- Active community

Motivation for this choice:

- Aggregations of descriptions
- Semantic concepts (ontologies)
- Frequently used by other approaches (CC/PP, UAProf, CSCP)

DEVICES

JENA Library
SPARQL queries
SGP profiles (RDF/XML)

Two platform:

Configuration 1:

- Laptop
- Windows 7 (x64)
- 6GB of RAM
- i7-2630QM quadruple core processor (2 GHz).



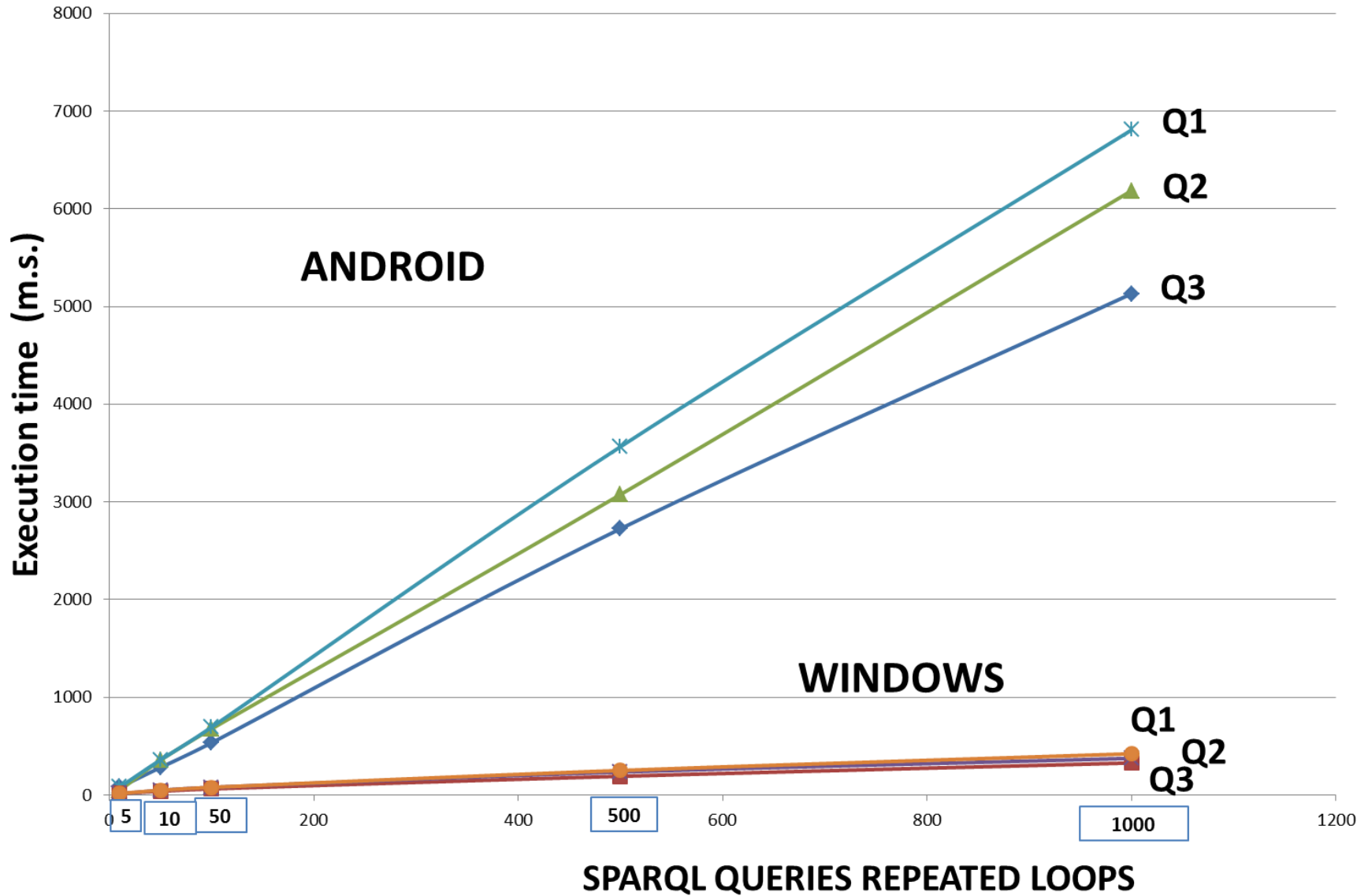
Configuration 2 :

- Tablet : Samsung Galaxy Tab 10.1
- Android 3.2
- 1 GB of RAM
- double core Tegra 2 processor (1 GHz).



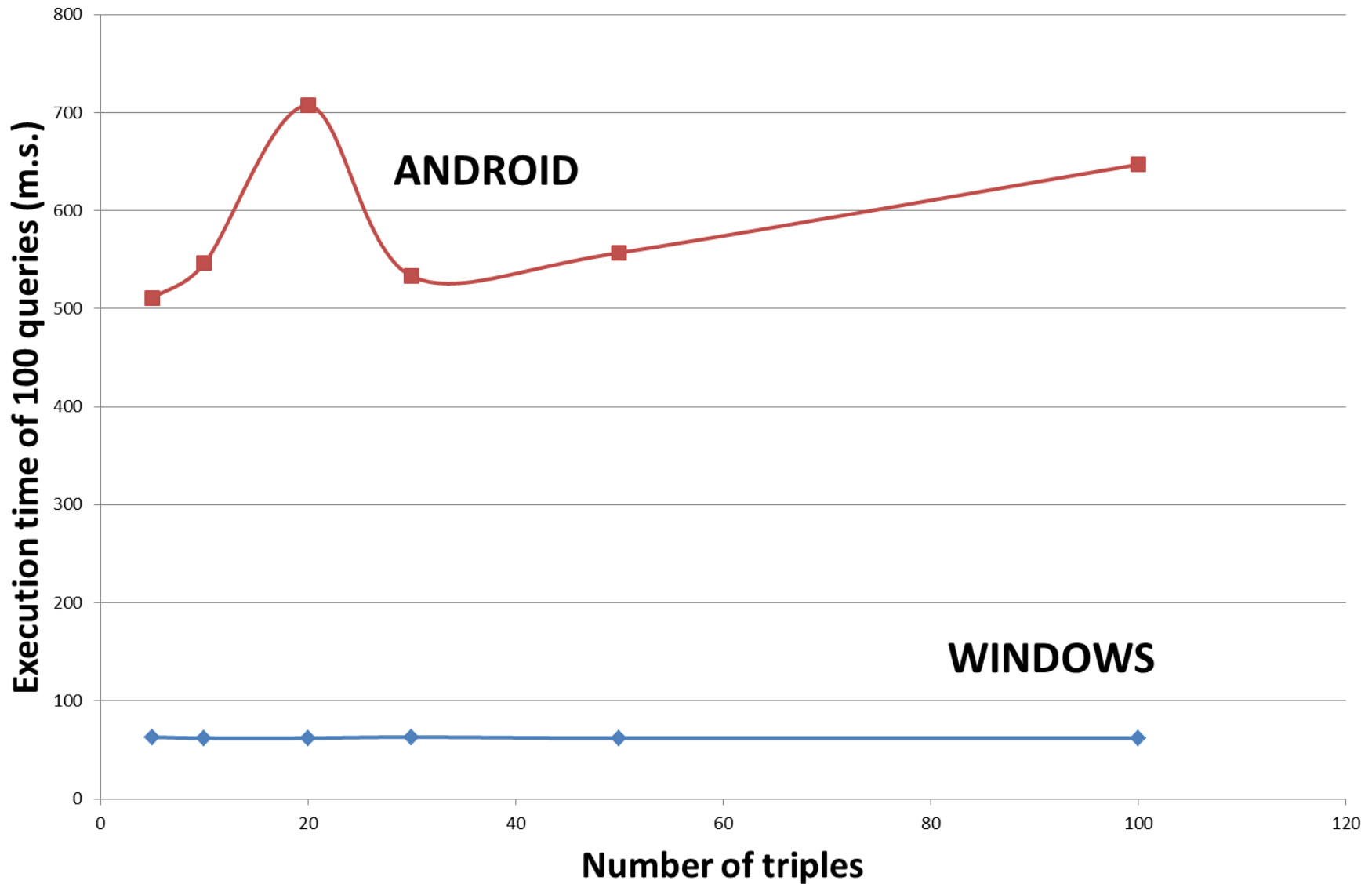
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EXECUTION TIME QUERIES



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SGP SIZE

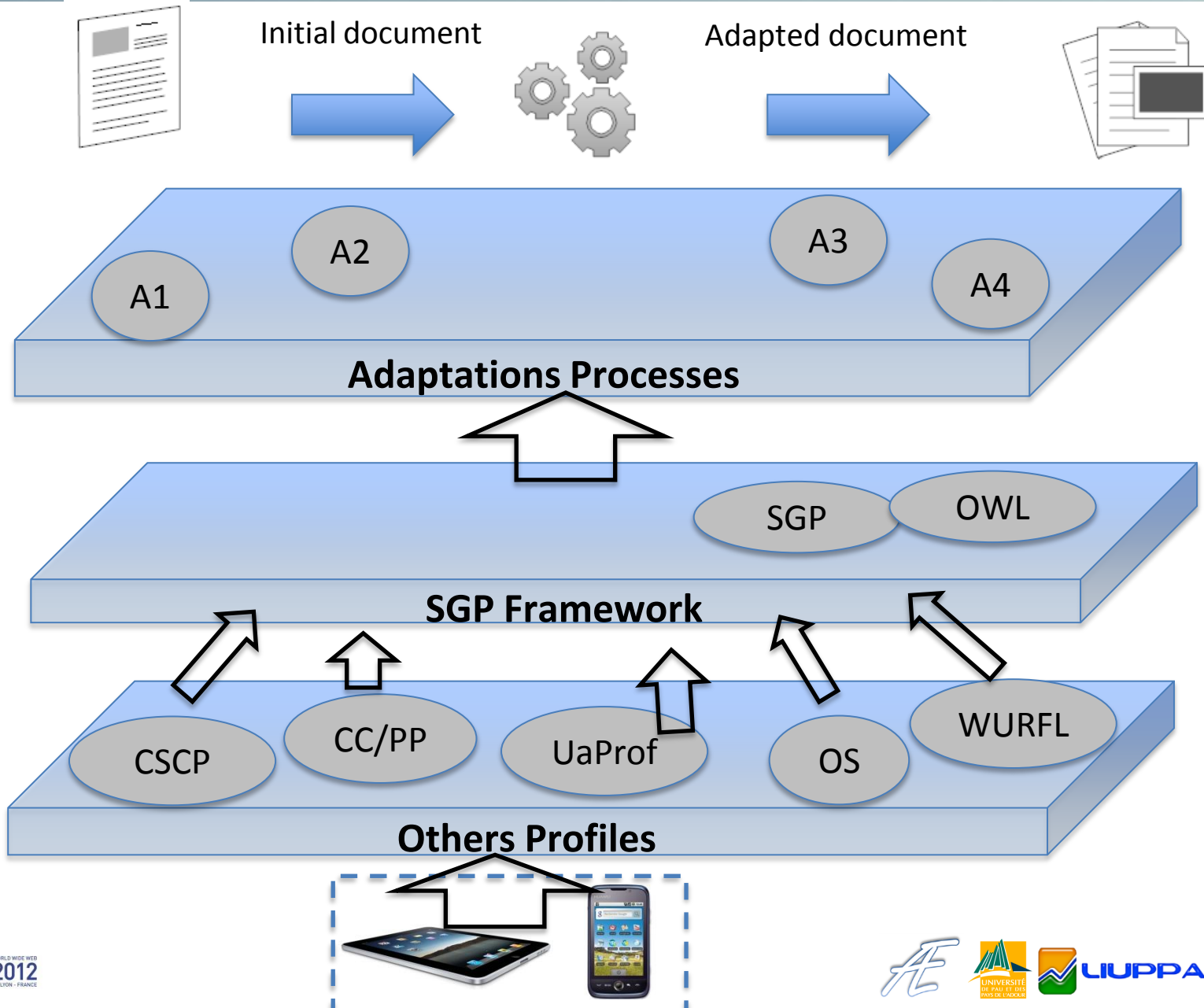




FUTURE RESEARCH DIRECTIONS

Towards an Interoperable Device Profile Containing Rich User Constraints

SGP environnement





CONCLUSION

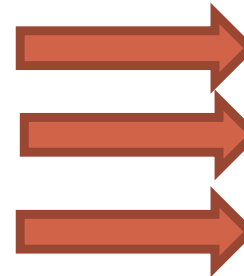
CONCLUSION

Our Goals:

- Describe multiple profile informations
- Model real-life user constraint
- A multi-platform profile

Our proposition:

- Facets : Device, document, context
- Explicit constraints
- Service-based



GENERIC

EXPRESSIVE

PORTABLE



QUESTIONS

SPARQL Queries

SPARQL

- RDF query oriented language
- retrieve and manipulate data stored in RDF descriptions
- standard by the RDF Data Access Working Group (DAWG) of the W3C
- key technologies of the Semantic Web

PREFIX sgp: <http://SGP#>

PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>

PREFIX rdfs: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>

PREFIX owl: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>

PREFIX xsd: <http://www.w3.org/2001/XMLSchema#>

SELECT ?s ?t WHERE {
 ?s rdf:type sgp:Service .
 ?s rdfs:label ?t .
}

SELECT ?s ?t WHERE {
 ?s rdf:type sgp:Service .
 ?s rdfs:label ?t .
}

SELECT ?s ?t ?f WHERE {
 ?s rdf:type sgp:Service .
 ?s rdfs:label ?t .
 ?s sgp:contains ?f .
 ?f rdf:type sgp:OutputFunction .
}

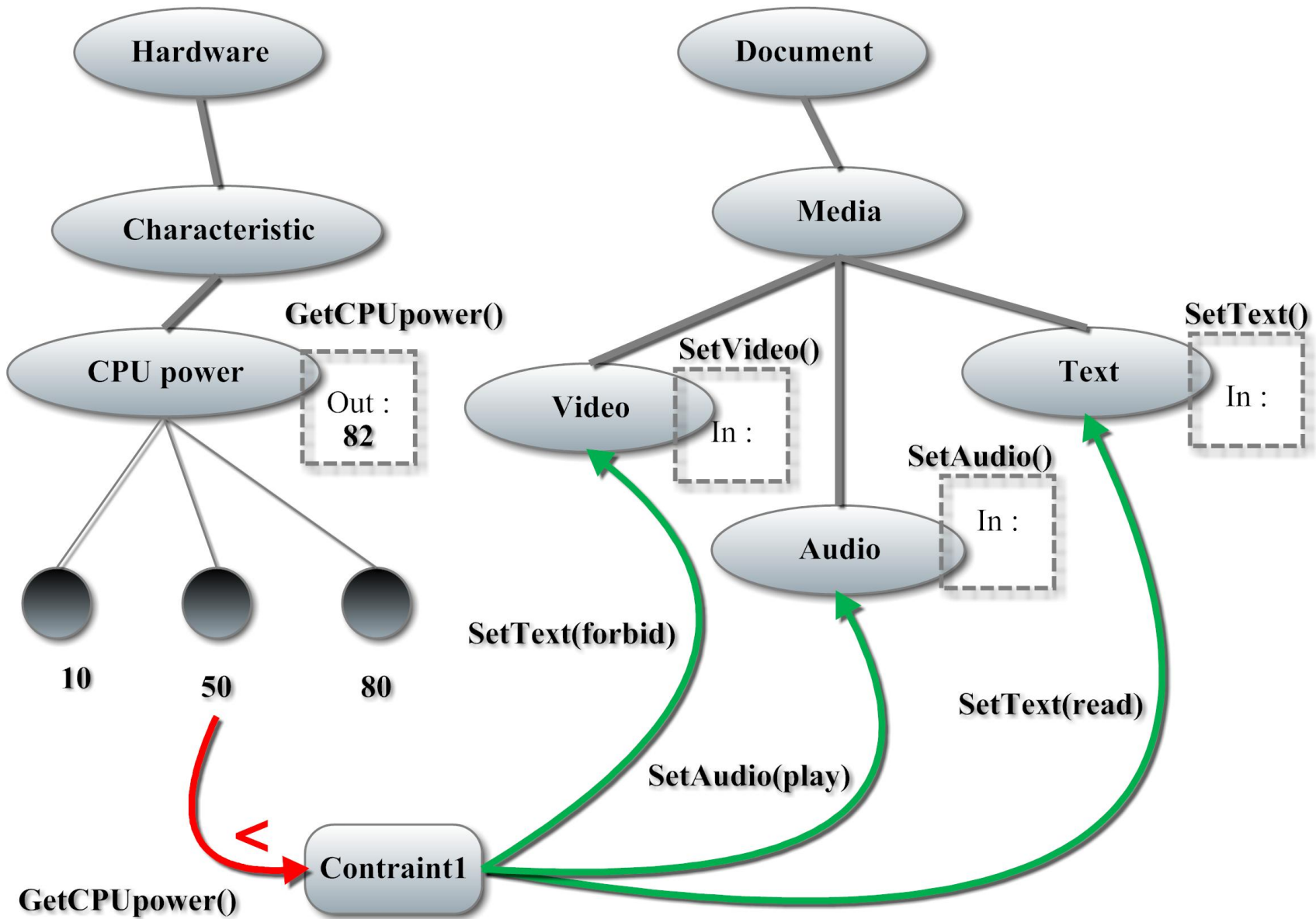
SELECT ?s ?t ?f WHERE {
 ?s rdf:type sgp:Service .
 ?s rdfs:label ?t .
 ?s sgp:contains ?f .
 ?f rdf:type sgp:OutputFunction .
}

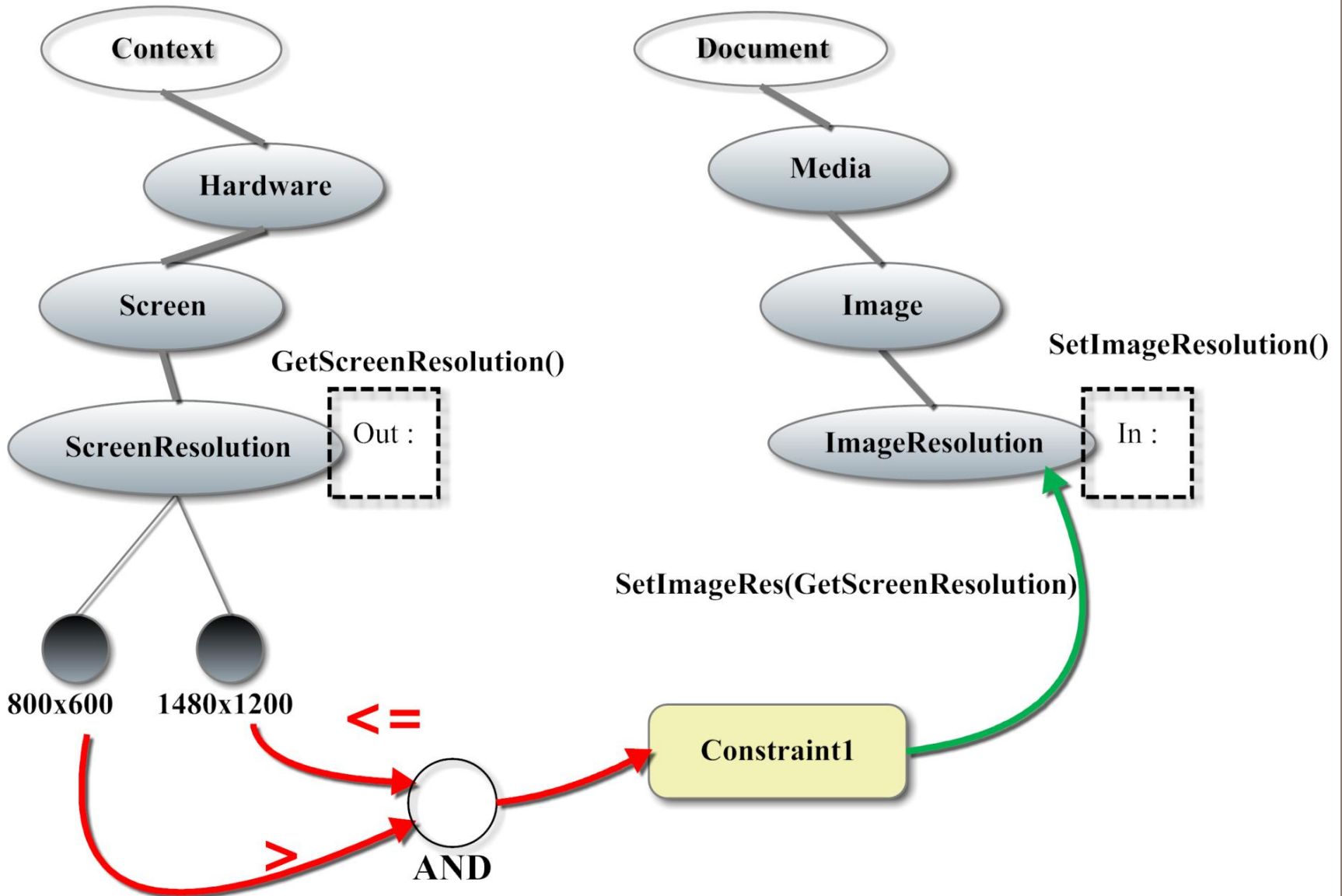
Query R2. SGP services list query

Query R3. List of services that could provide some data

Query R4. Services hierarchy

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