

# A Linked Open Data Service for Performing Arts

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# Linked Data

- **Web of documents**

- The current Web, where data is mixed into HTML
- Difficult to be processed from machines

- **Web of data**

- Data present into HTML is also accessible in a machine-friendly format
- Data is linked to other data in other repositories

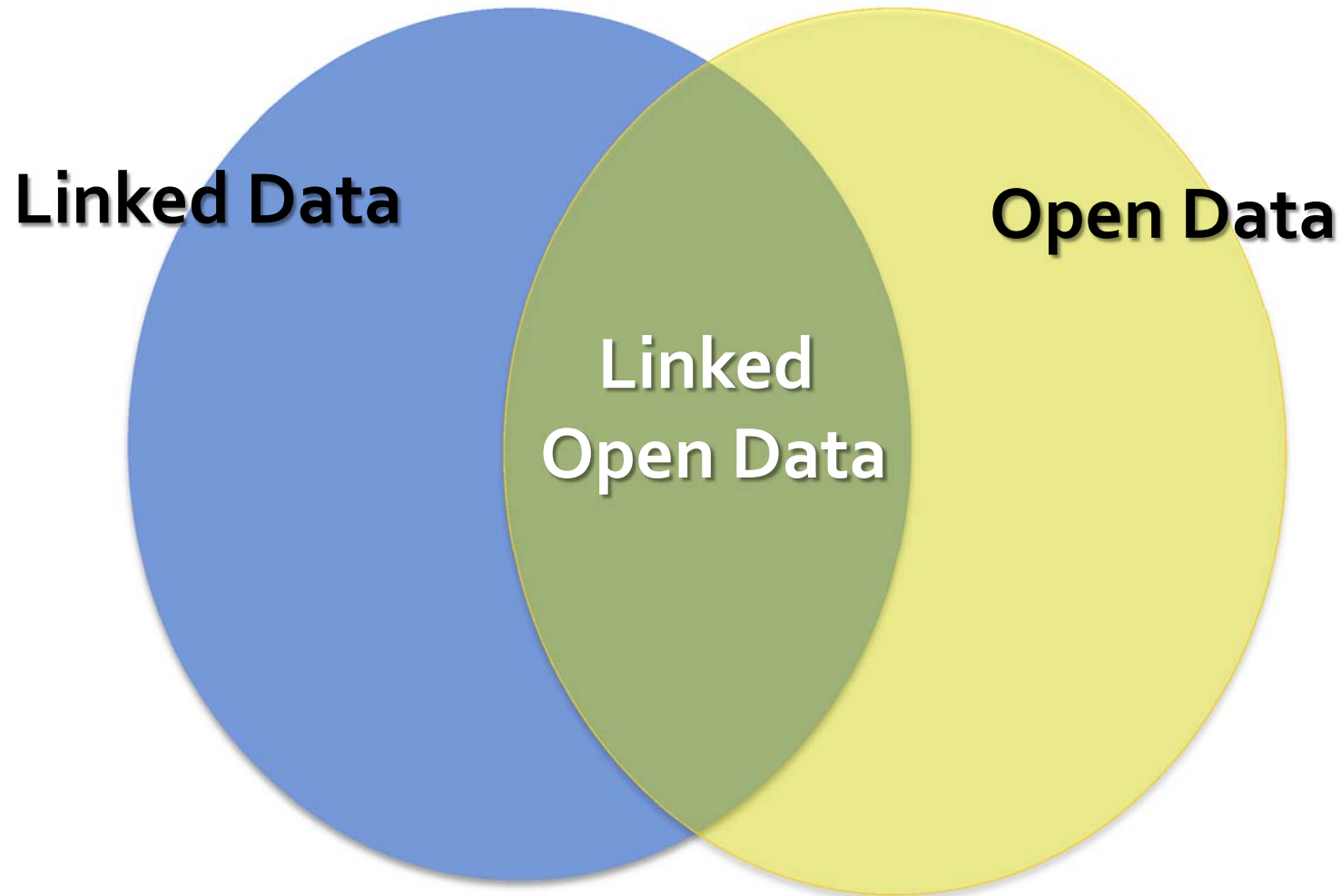
# Linked Data Principles

1. Use dereferenceable HTTP Uniform Resource Identifiers to identify resources
2. Use RDF standard to describe resources
3. Link to other linked data resources over the web

Moreover:

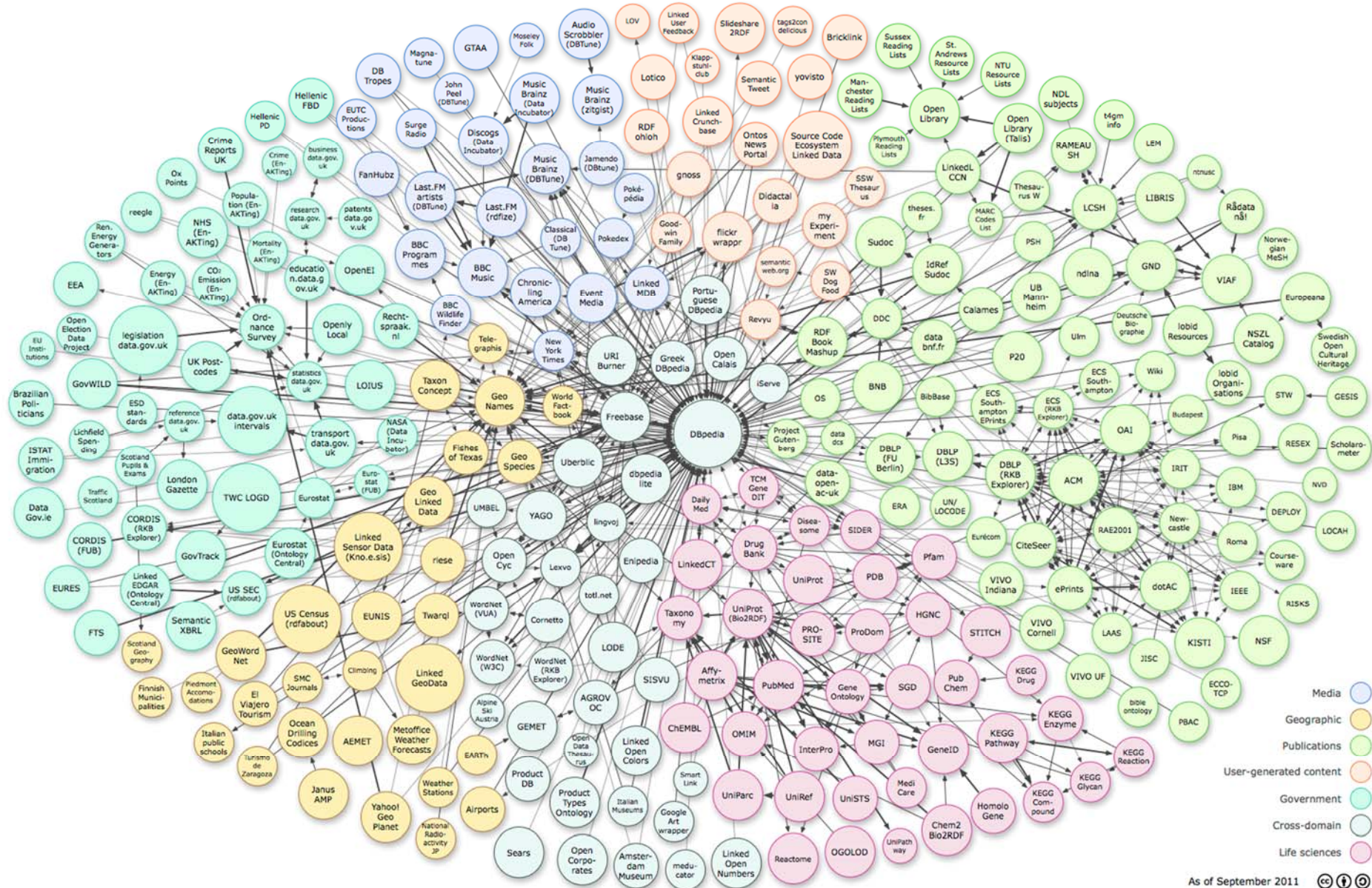
- Reuse vocabularies to describe resources or define them via subclass/subproperties
- Vocabularies should be available as Linked Data
- Popular vocabularies:
  - Dublin Core (human created artifacts)
  - Friend of a Friend (person, organizations and relations)
  - Creative Commons (legal information about works)
  - Basic Geo Vocabulary (geographical coords.)

# Linked Data & Open Data





# Linked Open Data



# Why LOD?

- Improve user experience with more contextual information
- Semantic Data in machine-friendly formats can be used to improve search experiences
- Used in Applications & API

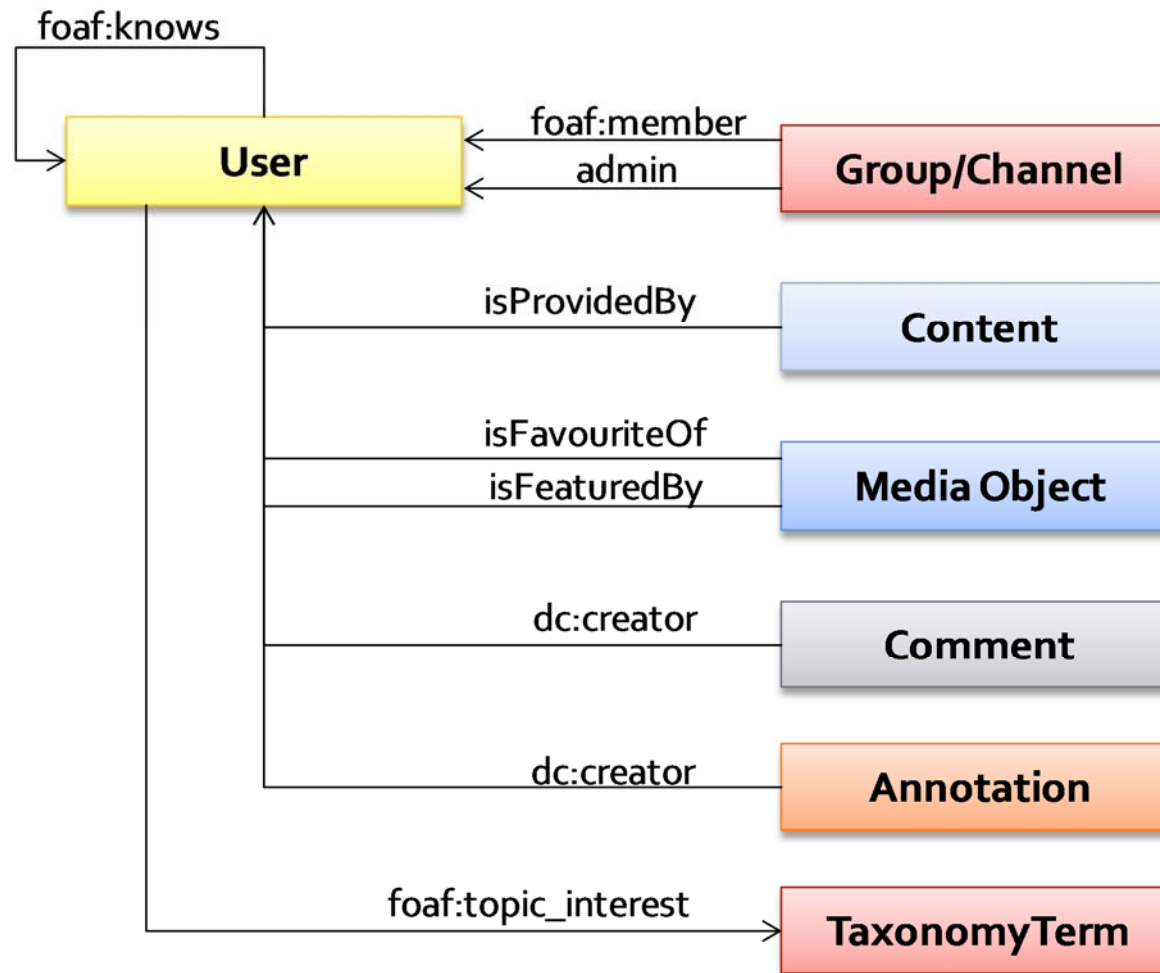
- Multimedia Archive of Performing Arts
  - content from 31 European content providers
  - from 13 countries
  - currently about 115,000 content items
  - video, audio, images, documents, 3D, Braille music scores, epub, crossmedia...
  
- Best practice network on Performing Arts
  - 3 working groups on
    - IPR issues
    - Education
    - Digital Libraries







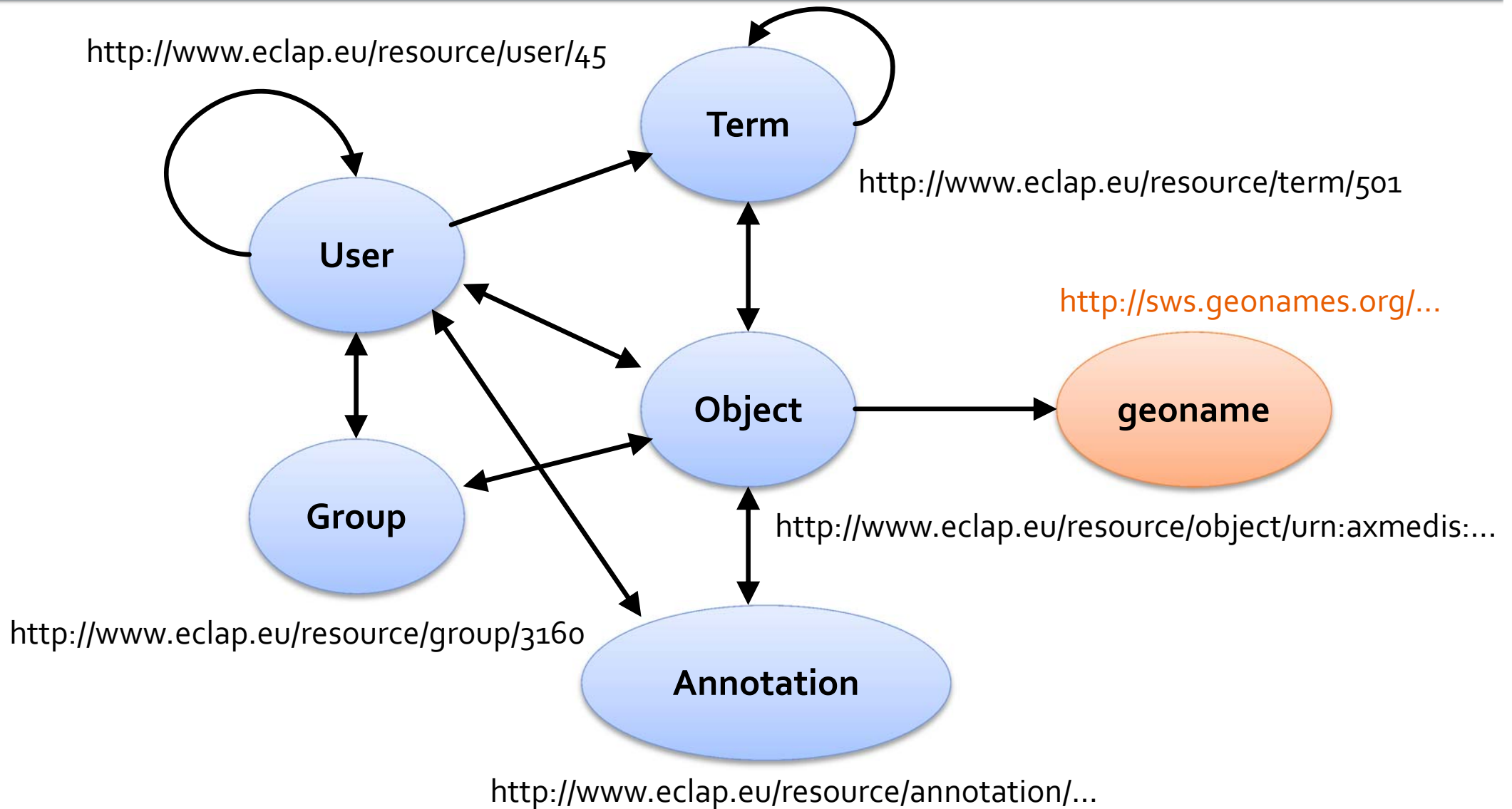
# ECLAP Semantic Model 2



# Linking ECLAP data

- Links to *Geonames* a LOD repository of Geographical names
- Metadata in fields like
  - dc:coverage,
  - dcterms:spatial
  - (first)Performance Place,
  - (first)Performance City,
  - (first)Performance Countryare analyzed to match with geographical names from the GeoNames archive
- About 40000 relations found

# URIs & Links



# Object description

- Use Dublin Core vocabulary
- For Performing Arts Metadata use a custom vocabulary with properties defined as specializations of Dublin Core properties
  - performancePlace → dcterms:spatial
  - performanceCity → dcterms:spatial
  - performanceCountry → dcterms:spatial
  - performanceDate → dcterms:issued
  - performingArtsProfessional → dcterms:contributor
  - dancer → performingArtsProfessional
  - actor → performingArtsProfessional
  - director → performingArtsProfessional
  - ...

```
<rdf:RDF ...>
```

```
<rdf:Description rdf:about="http://www.eclap.eu/resource/object/urn:axmedis:00000:obj:04...">
```

```
<dc:title xml:lang="en">you PARA | DISO</dc:title>
```

```
<dc:description xml:lang="en">In July 2010 Emio Greco and Pieter C. Scholten presented their performance "you PARA | DISO" at Salle Garnier de l'Opéra de Monte-Carlo. You PARA | DISO is the last performance around Dante's Divina Commedia. ... </dc:description>
```

```
<dc:publisher xml:lang="en">iTheatre</dc:publisher>
```

```
<dc:subject xml:lang="en">dance</dc:subject>
```

```
<dc:format>video</dc:format>
```

```
<dc:creator xml:lang="en">emio greco & pc</dc:creator>
```

```
<dc:creator xml:lang="en">erik lint</dc:creator>
```

```
...
```

```
<eclap:performancePlace>Salle Garnier de l'Opéra de Monte-Carlo</eclap:performancePlace>
```

```
<eclap:performanceCity>Monte-Carlo</eclap:performanceCity>
```

```
<eclap:performanceCountry>Monaco</eclap:performanceCountry>
```

```
<eclap:performanceCountry rdf:resource="http://sws.geonames.org/2993457/">
```

```
<eclap:performanceDate>July 2010</eclap:performanceDate>
```

```
<eclap:choreographer>Emio Greco</eclap:choreographer>
```

```
<eclap:choreographer>Pieter C. Scholten</eclap:choreographer>
```

```
<eclap:historicalPeriod rdf:resource="http://www.eclap.eu/resource/term/567"/>
```

```
<eclap:performingArtsType rdf:resource="http://www.eclap.eu/resource/term/501"/>
```

```
<eclap:managementAndOrganization rdf:resource="http://www.eclap.eu/resource/term/514"/>
```

```
<dcterms:isPartOf rdf:resource="http://www.eclap.eu/resource/object/urn:axmedis:00000...">
```

```
<eclap:hasAnnotation rdf:resource="http://www.eclap.eu/resource/annotation/SideAnnotation_130...">
```

```
/>
```

```
...
```

```
</rdf:Description>
```

```
</rdf:RDF>
```



# Term description

- ECLAP provides six thesauri of terms for the classification of content (for a total of 231 terms):
  - **Subject** (e.g., Teaching, Philosophy, Multiculture)
  - **Genre** (e.g., Comedy, Comic, Drama)
  - **Historical period** (e.g., Contemporary, Classical, XX Century)
  - **Movement and style** (e.g., Experimental, Theatre of the absurd)
  - **Performing arts type** (e.g., Dance, Ballet, Music, Rock, Theatre, Noh)
  - **Management and organization** (e.g., Performance, Choreography )

# Term description

- Use SKOS vocabulary

```
<rdf:RDF>
```

```
<skos:Concept rdf:about="http://www.eclap.eu/resource/term/501">
```

```
<skos:prefLabel xml:lang="it">Danza</skos:prefLabel>
```

```
<skos:prefLabel xml:lang="en">Dance</skos:prefLabel>
```

```
...
```

```
<skos:broader rdf:resource="http://www.eclap.eu/resource/term/664"/>
```

```
<skos:narrower rdf:resource="http://www.eclap.eu/resource/term/540"/>
```

```
<skos:narrower rdf:resource="http://www.eclap.eu/resource/term/539"/>
```

```
<skos:narrower rdf:resource="http://www.eclap.eu/resource/term/507"/>
```

```
<skos:narrower rdf:resource="http://www.eclap.eu/resource/term/506"/>
```

```
<eclap:isSubjectOf
```

```
  rdf:resource="http://www.eclap.eu/resource/object/urn:axmedis:000... "/>
```

```
<eclap:isSubjectOf
```

```
  rdf:resource="http://www.eclap.eu/resource/object/urn:axmedis:000... "/>
```

```
...
```

```
</skos:Concept>
```

```
</rdf:RDF>
```

# Group description

- Use FOAF vocabulary

```
<rdf:RDF>
```

```
<foaf:Group rdf:about="http://www.eclap.eu/resource/group/2859">
```

```
<rdfs:label>Centro Teatro Ateneo, University of Rome La Sapienza, UNIROMA, Italia</rdfs:label>
```

```
<eclap:admin rdf:resource="http://www.eclap.eu/resource/user/1"/>
```

```
<eclap:admin rdf:resource="http://www.eclap.eu/resource/user/253"/>
```

```
...
```

```
<foaf:member rdf:resource="http://www.eclap.eu/resource/user/1"/>
```

```
<foaf:member rdf:resource="http://www.eclap.eu/resource/user/42"/>
```

```
...
```

```
<eclap:provide rdf:resource="http://www.eclap.eu/resource/object/urn:axmedis..."/>
```

```
<eclap:provide rdf:resource="http://www.eclap.eu/resource/object/urn:axmedis..."/>
```

```
...
```

```
</foaf:Group>
```

```
</rdf:RDF>
```

# User description

- Use FOAF vocabulary

```
<rdf:RDF ...>
```

```
<foaf:Person rdf:about="http://www.eclap.eu/resource/user/45">
```

```
<foaf:nick>bellini</foaf:nick>
```

```
<foaf:knows rdf:resource="http://www.eclap.eu/resource/user/1" />
```

```
...
```

```
<foaf:topic_interest rdf:resource="http://www.eclap.eu/resource/term/501" />
```

```
<eclap:isMemberOf rdf:resource="http://www.eclap.eu/resource/group/3160" />
```

```
<eclap:isAdminOf rdf:resource="http://www.eclap.eu/resource/group/3160" />
```

```
<eclap:hasFavorite
```

```
  rdf:resource="http://www.eclap.eu/resource/object/urn:axmedis:ooo..." />
```

```
<eclap:hasFeatured
```

```
  rdf:resource="http://www.eclap.eu/resource/object/urn:axmedis:ooo..." />
```

```
<eclap:createdAnnotation
```

```
  rdf:resource="http://www.eclap.eu/resource/annotation/SideAnnotation..." />
```

```
</foaf:Person>
```

```
</rdf:RDF>
```

# Annotation description

- Use Open Annotation Collaboration vocabulary (<http://www.openannotation.org>)
- Annotations can be associated with whole audiovisual or to a temporal fragment
- Body of an annotation can be a text and/or another audiovisual (as a whole or a fragment)
- **MyStoryPlayer** is the tool used navigate annotations



```
<rdf:RDF xmlns:oa="http://www.w3.org/ns/oa#"
  xmlns:cnt="http://www.w3.org/2011/content#">
  <oa:Annotation
    rdf:about="http://www.eclap.eu/resource/annotation/SideAnnotation_13010...">
    <oa:hasTarget>
      <oa:SpecificResource>
        <oa:hasSource
          rdf:resource="http://www.eclap.eu/resource/object/urn:axmedis:o.."/>
          <oa:hasSelector>
            <oa:FragmentSelector>
              <rdf:value>t=npt:10,60</rdf:value>
              <dcterm:conformsTo rdf:resource="http://www.w3.org/TR/media-frags/" />
            </oa:FragmentSelector>
          </oa:hasSelector>
        </oa:SpecificResource>
      </oa:hasTarget>
      <oa:hasBody rdf:resource="http://www.eclap.eu/resource/object/urn:axmedis:..." />
      <oa:hasBody>
        <cnt:ContentAsText>
          <cnt:chars>this is an annotation</cnt:chars>
          <dc:format>text/plain</dc:format>
        </cnt:ContentAsText>
      </oa:hasBody>
      <oa:annotatedBy rdf:resource="http://www.eclap.eu/resource/user/1"/>
      <oa:annotatedAt>2013-02-28T20:00:00</oa:annotatedAt>
    </oa:Annotation>
```

# Navigating Linked Data

- Linked data browsers (e.g. Q&D RDF Browser)

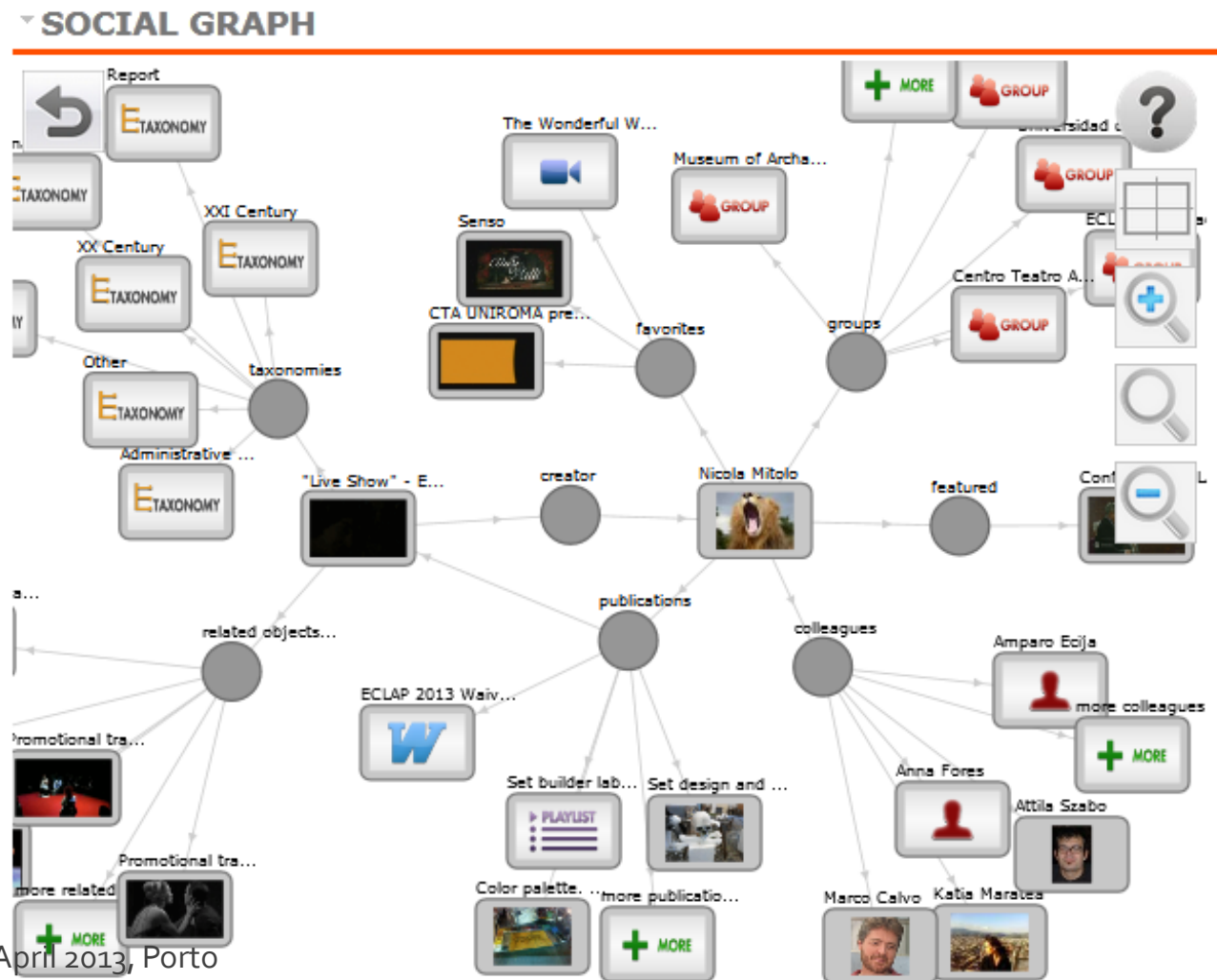


The screenshot shows a web browser window displaying the Q&D RDF Browser interface. The address bar shows the URL: <http://www.eclap.eu/resource/object/urn:...:04e0caef-b33b-4f4a-ba50-a80d96766192>. The page title is "you PARA | DISO". The main content area displays a list of triples (RDF statements) for the resource. The triples include:

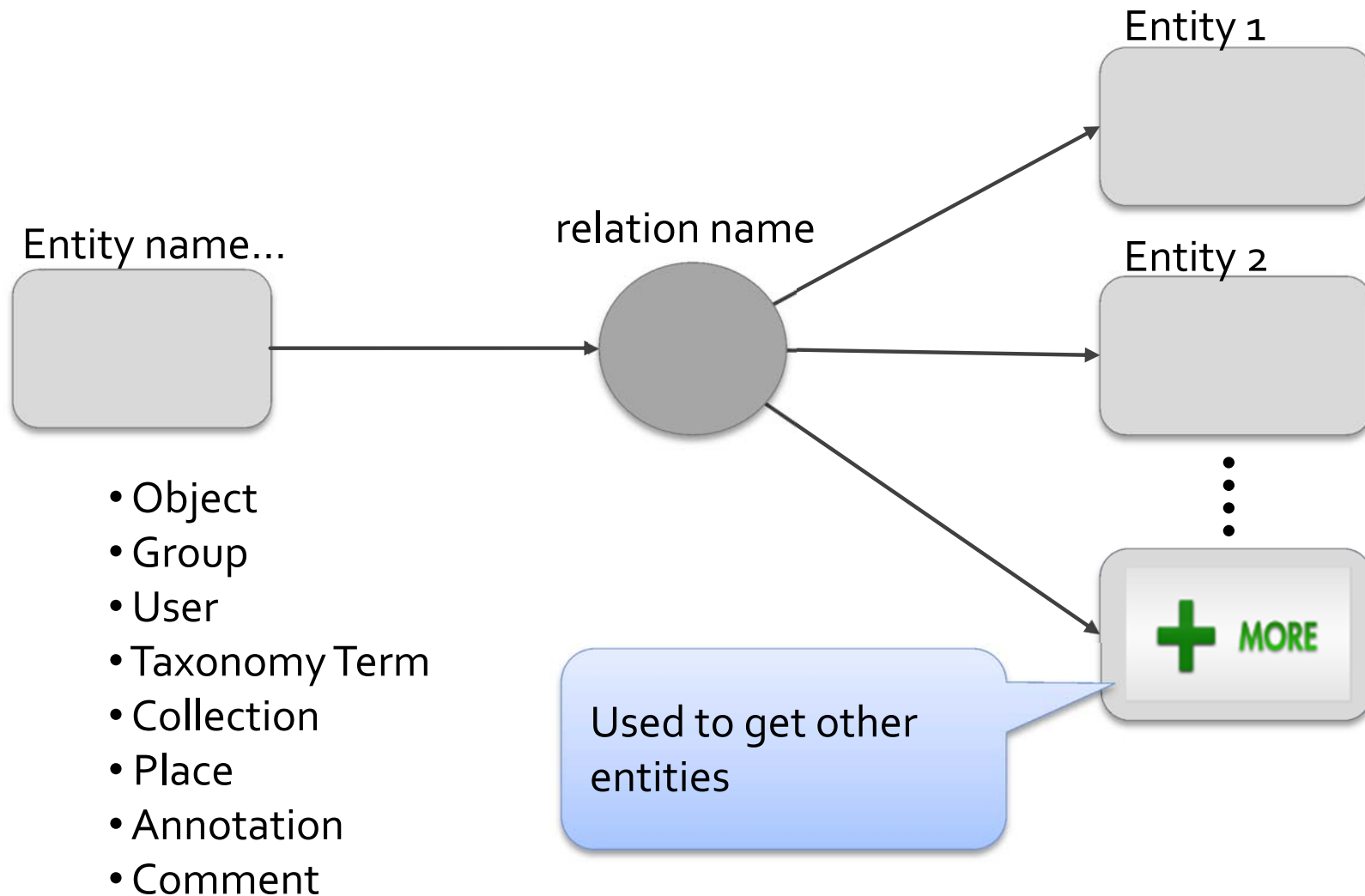
- `dc:rights` → "emo greco & PC"@fr, "Erik Flusen"@de, "emo Greco & PC"@de, "Dolce erik"@it ...show 18 more...
- `dc:description` → "In juli 2010 Emio Greco en Pieter C. Scholten presenteerden hun performance te 'je PARA | Diso' Salle Garnier op de l'Opera de Monte-Carlo. U PARA | Diso is de laatste voorstelling rond Dante's Divina Commedia. Net als bij het laatste deel van het boek het onderwerp van deze voorstelling is het paradijs. In de aanloop naar de première van je PARA | Diso zij zullen nemen u mee langs hun reis naar het paradijs. Maar wat is het dat wij het paradijs noemen? Door middel van tien vragen, waarmee ze ook zijn geconfronteerd in hun artistieke proces, proberen ze dichterbij de essentie van het paradijs krijgen. Laten we allemaal naar Paradijs!"@nl, "En Juillet 2010 Emio Greco et Pieter C. Scholten ont présenté leurs performance 'vous PARA | OCIM' à la Salle Garnier de l'Opéra de Monte-Carlo. Vous PARA | OCIM est le dernier spectacle autour de la Divina Commedia de Dante. Comparable à la dernière partie du livre fait l'objet de cette performance, c'est le paradis. Dans la perspective de la première d'entre vous PARA | OCIM ils vous emmènent leur voyage vers le paradis. Mais qu'est-ce que nous appelons le paradis? Par le biais de dix questions, avec lesquels ils ont été confrontés dans leur démarche artistique, ils essaient de se rapprocher de l'essence de paradis. On va tous au Paradijs!"@en, "Em Julho de 2010 Emio Greco e Pieter C. Scholten apresentaram suas performance 'você PARA | DISO' na Salle Garnier de l'Opéra de Monte-Carlo. Você PARA | DISO é a última performance ao redor Divina Comédia de Dante. Similar à última parte do livro o tema deste desempenho é o paraíso. Em vésperas da estreia de você PARA | DISO que irá levá-lo ao longo de sua viagem ao paraíso. Mas o que é que nós chamamos de paraíso? Por meio de dez questões, com o qual eles também têm sido confrontado no seu processo artístico, que tentam aproximar-se a essência do paraíso. Vamos todos ao Paraíso!"@pt, "Im Juli 2010 Emio Greco und Pieter C. Scholten präsentierten ihre Das Konzert 'Sie PARA | DISO' in der Salle Garnier de l'Opéra de Monte-Carlo. Sie PARA | DISO ist die letzte Aufführung in Dantes Divina Commedia. Ähnlich wie bei den letzten Teil des Buches die Gegenstand dieser Leistung ist das Paradies. Im Vorfeld der Uraufführung von Ihnen PARA | DISO laufen Sie erhalten sie entlang ihrer Reise ins Paradies zu nehmen. Aber was ist es, dass wir Paradies nennen? Mit Hilfe von zehn Fragen, mit denen sie auch in ihrem künstlerischen Prozess konfrontiert wurden, versuchen sie näher an die Essenz des Paradieses zu erhalten. Let's go, um alle Paradijs!"@de ...show 9 more...
- `dc:format` → "video"
- `dc:identifier` → "Paradiso\_prores-Vimeo\_HD.mp21"
- `dc:publisher` → "ITheatre"@en
- `dc:subject` → "dansa"@ca, "taniec"@pl, "χορός"@el, "dança"@pt ...show 9 more...
- `dc:title` → "Ci PARA | Diso"@pl, "vi PARA | DISO"@sl, "PARA-vous | OCIM"@fr, "Sie PARA | DISO"@de ...show 9 more...
- `dc:type` → "video"
- `dc:date` → "Monday, August 23, 2010"
- `dc:creator` → "emio greco & pc"@en, "erik lint"@en
- `http://www.eclap.eu/schema/eclap/choreographer` → "Emio Greco", "Pieter C. Scholten"
- `http://www.eclap.eu/schema/eclap/performancePlace` → "Salle Garnier de l'Opéra de Monte-Carlo"
- `http://www.eclap.eu/schema/eclap/performanceCity` → "Monte-Carlo"
- `http://www.eclap.eu/schema/eclap/performanceCountry` → "Monaco", <http://sws.geonames.org/2993457/>
- `http://www.eclap.eu/schema/eclap/performanceDate` → "July 2010"
- `http://www.eclap.eu/schema/eclap/artistMovementAndActingSchool` → <http://www.eclap.eu/resource/term/664>, <http://www.eclap.eu/resource/term/501>

# Visual Semantic Navigation

- ECLAP Social Graph



# Graph elements



# Graph relations 1

- Object →
  - creator → User
  - groups → Group, ...
  - annotations → Annotation, ...
  - related objects → Object, ...
  - taxonomies → TaxonomyTerm, ...
  - comments → Comment, ...
  - favorite → User, ...
  - places → Place, ...
  - collections → Collection, ...



# Graph relations 2

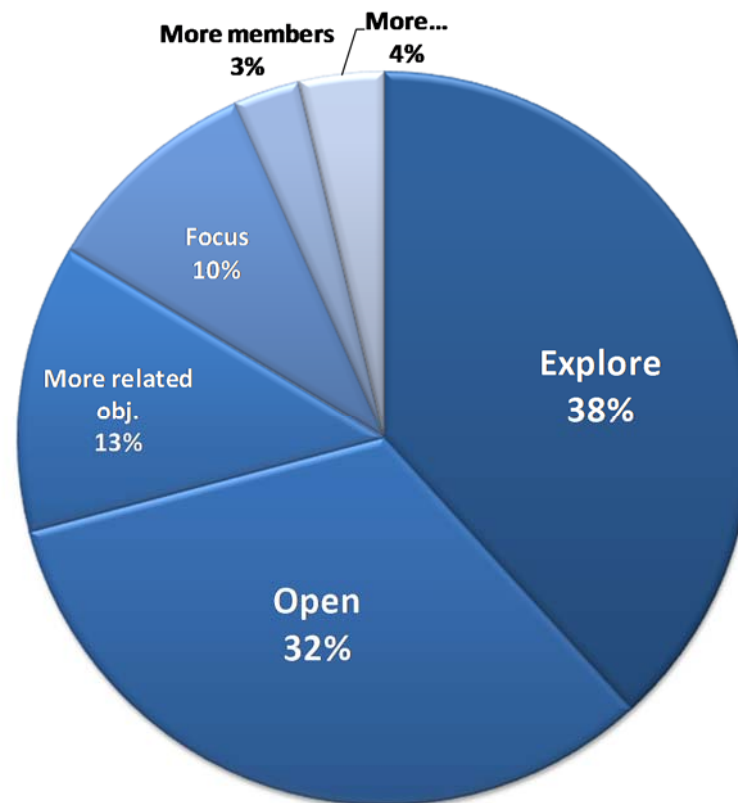
- User →
  - colleagues → User, ...
  - published → Object, ...
  - favorite → Object, ...
  - featured → Object, ...
- Collection →
  - objects → Object, ...
- TaxonomyTerm →
  - objects → Object, ...
  - broader → TaxonomyTerm, ...
  - narrower → TaxonomyTerm, ...
- Place →
  - objects → Object, ...

# Operations

- Operations on nodes
  - **Explore**, add node relations to the graph
  - **Reduce**, remove node relations from the graph
  - **Focus**, clear all and start from the node
  - **Open**, see the associated content
- Other operations
  - **Zoom, Pan**
  - **Back**
  - **Show/hide relations types**

# Social Graph use analysis

- In 2 months 6% of users watching a content interacted with the social graph (explore, open, focus, more...)



1366 operations

# Conclusions

- ECLAP data is available as Linked Open Data
- A specific vocabulary was defined and it is available for reuse <http://www.eclap.eu/schema/eclap>
- Semantic relations are navigable using ECLAP Social Graph
- Future work
  - Provide a SPARQL endpoint
  - Link to other repositories as DBPedia
  - Provide owl:sameAs relations with Europeana LOD