Towards a musical Semantic Web

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Overview

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- **Introduction**
  - Web
  - Web of data
- **The Semantic Web**
  - RDF
  - Making sense of the data
  - Content negotiation
- **The Music Ontology**
  - The Timeline ontology
  - The Event ontology
  - FRBR + FOAF
  - Music *production* specific concepts
  - Workflow information
  - Levels of expressiveness
  - Extensions
- **And now??**
  - Linking open data on the Semantic Web
  - Two applications

Introduction – Web

Looking for Creative Commons-licensed song from the French band *Lonah*

1. I ask my favourite search engine for "*Lonah creative commons song*"

Tryad – Music at Last.fm
Tagged as: **creative commons**, electronic, ambient. People who like Tryad also like Ehma, Revolution Void, **Lonah**. Learn more about Tryad at Last.fm, **...**
www.last.fm/music/Tryad/+journal - 108k - Cached - Similar pages

Lonah – Music at Last.fm
Learn more about **Lonah** at Last.fm, the world's largest social music platform. **...** Play piano Tag Radio Play in pop up · Play **creative commons** Tag Radio Play **...**
www.last.fm/music/**Lonah** - 85k - Cached - Similar pages
[More results from www.last.fm]

annma's blog
jamendo.com is also a very good place to download **creative commons** music, **...** p.o. box, try^d, drunksouls, thierry blanchard, -=kwada=-, **lonah**, and more :) **...**
annma.blogspot.com/2006/06/free-music.html - 11k - Cached - Similar pages

Internet Archive: Details: Black Sweater White Cat 11.26.2005
Program in focused on copyleft and **creative commons** music by the people, **...** http://www.wmrecordings.com/ **song**: Artiste album: PiÃ¨ces artist: **Lonah ...**
www.archive.org/details/bswc11262005 - 21k - Cached - Similar pages

Internet Archive: Details: Black Sweater, White Cat 01.28.06
Black Sweater, White Cat is focused on copyleft or **creative commons** licensed music from around the internet **...** This edition is 100% **Creative Commons** music. **...**
www.archive.org/details/BSWC012806 - 20k - Cached - Similar pages

Introduction – Web

Looking for Creative Commons-licensed song from the French band *Lonah*

2. I read the *context* of each of the first results
3. The second one seems ok...
4. I reach this *last.fm* page:

Lonah

20,015 plays scrobbled on Last.fm

Lonah is a young French rock band. Music available on http://www.jamendo.com/us

Edit this artist description

User Tags (see more)

cabaret creative commons dreamy female vocalists **french** jamendo piano rock

Tag this artist

5. According to the tags, it looks like the band I am looking for...
6. I read "Music available on ..." and decide to visit the linked page
7. I reach the Jamendo website
8. I launch a search for *Lonah*, and, finally:

	5	Crepuscule	4:20
	6	Les amants de cristal	5:54
	7	Les effacés	4:05
	8	Fractale	3:47

Introduction – Web

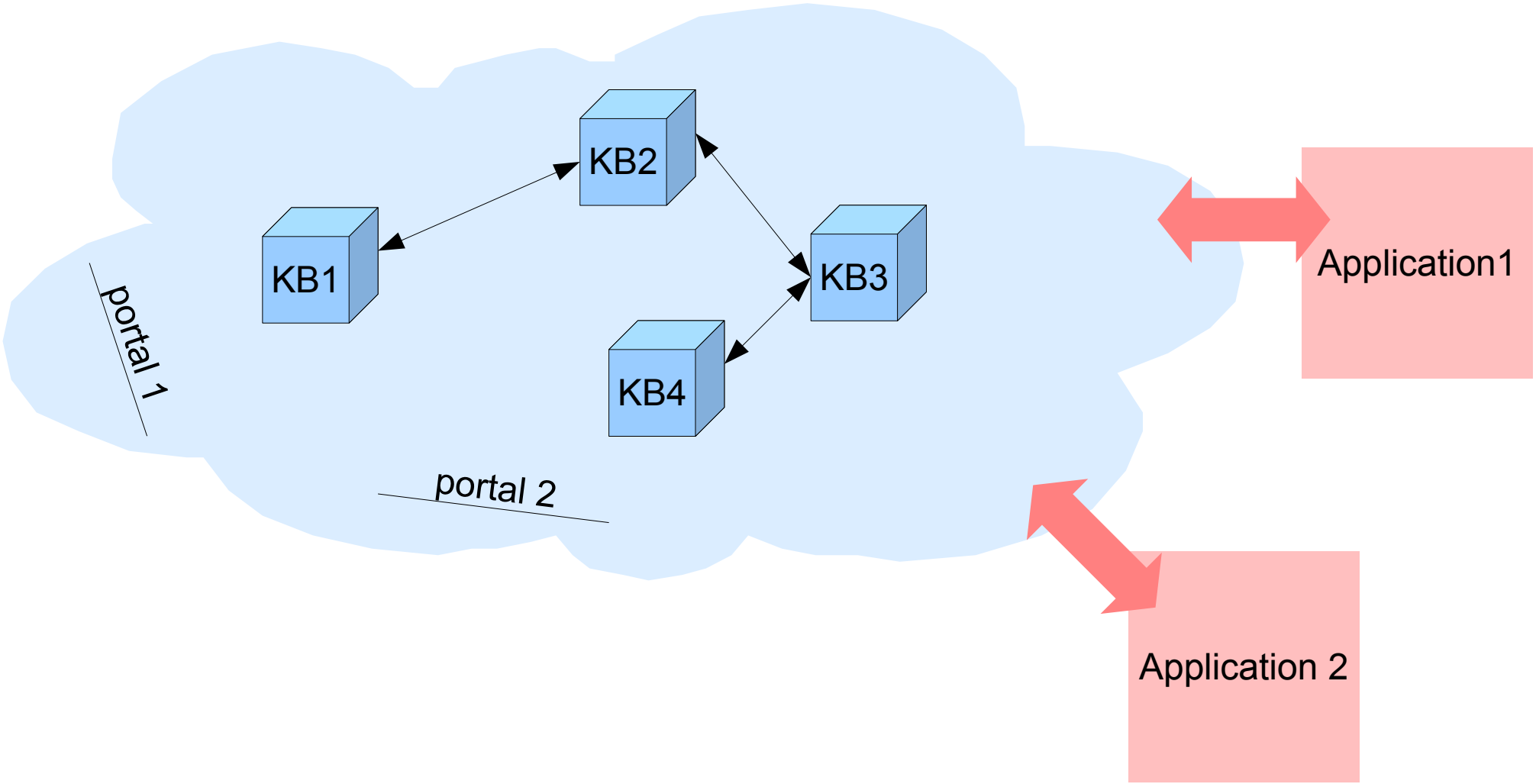
Some requirements emerging from this scenario:

- I need an entry point: the **search engine**
- I need to understand the **context** of the links
- I need to find my way into the **web maze**

Now: **Ask your computer to do the same thing!**

Introduction – Web of data

Turning the Web into a huge, “semantic”, democratic database in order to make machines able to look by themselves for particular informations



The Semantic Web

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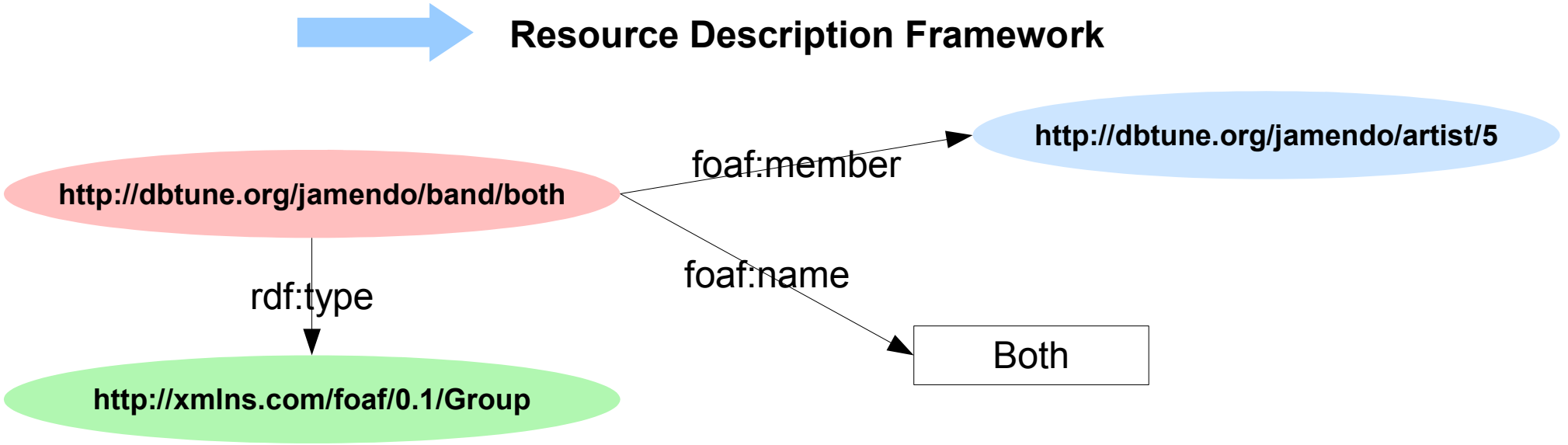
Resources on the Web can be far more than just web pages!

http://moustaki.org/foaf.rdf#moustaki is a resource representing *me*

http://dbtune.org/jamendo/band/lonah is a resource representing the band *Lonah*

When HTTP-GETting, Let's leave fancy HTML pages for humans, and let's provide some useful descriptions for the machine!



Ontologies - Making sense of the data

Ontologies, to map these **resources and properties (links)** to **real-world objects and relationships**

Providing a COMMON UNDERSTANDING

An **Album** has several **Tracks**, a **name**, a **release date**...
A **Performance** has one **location**, one **time**, some **performers**, ...

Ontologies are also described in **RDF**

Instance data **refers** to ontologies through RDF triples such as:

- <http://dbtune.org/jamendo/artist/5> rdf:type <http://purl.org/ontology/mo/Musicartist>
- <http://dbtune.org/jamendo/artist/5> foaf:name “Both”

Content negotiation

And now, let's make both the **human** and the **machine** happy!

http://dbtune.org/jamendo/artist/5

HTML for “human consumption”

```
<mo:MusicArtist
rdf:about="http://dbtune.org/jamendo/artist/5">
   <foaf:based_near
rdf:resource="http://dbpedia.org/France"/>
  <foaf:homepage rdf:resource="http://www.both-
world.com"/>
  <foaf:img
rdf:resource="http://img.jamendo.com/artists/b/both.j
pg"/>
  <foaf:name
rdf:datatype="&xsd;string">Both</foaf:name>
</mo:MusicArtist>
```

RDF for “machine consumption”

The Music Ontology

Problem: no agreed ways of dealing with music-related information on the Semantic Web

Solution: Let's launch a community project, based on previous ontology engineering efforts!

http://musicontology.com/

Several facets [Pachet]:

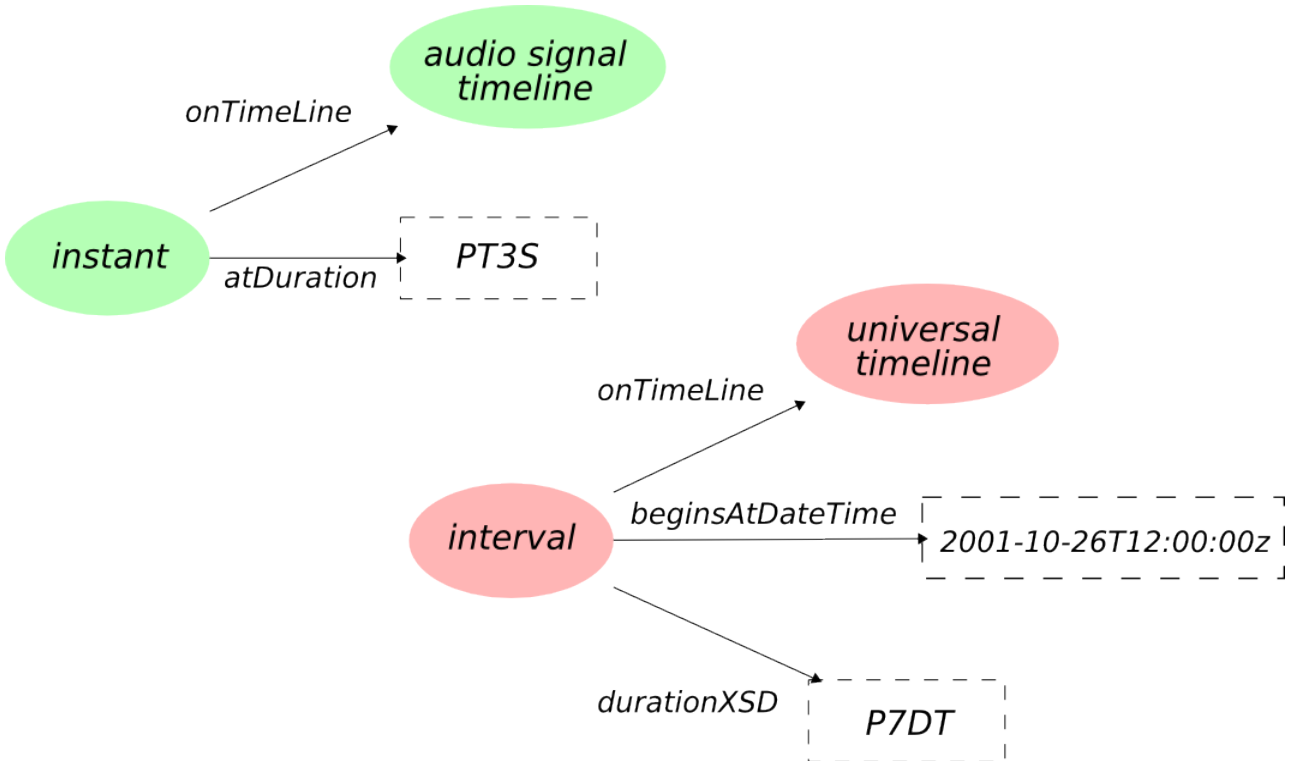
- Complex *editorial* information
- *Acoustic* information
- (*cultural* information)

The Timeline ontology

First thing to address: representing *temporal information*

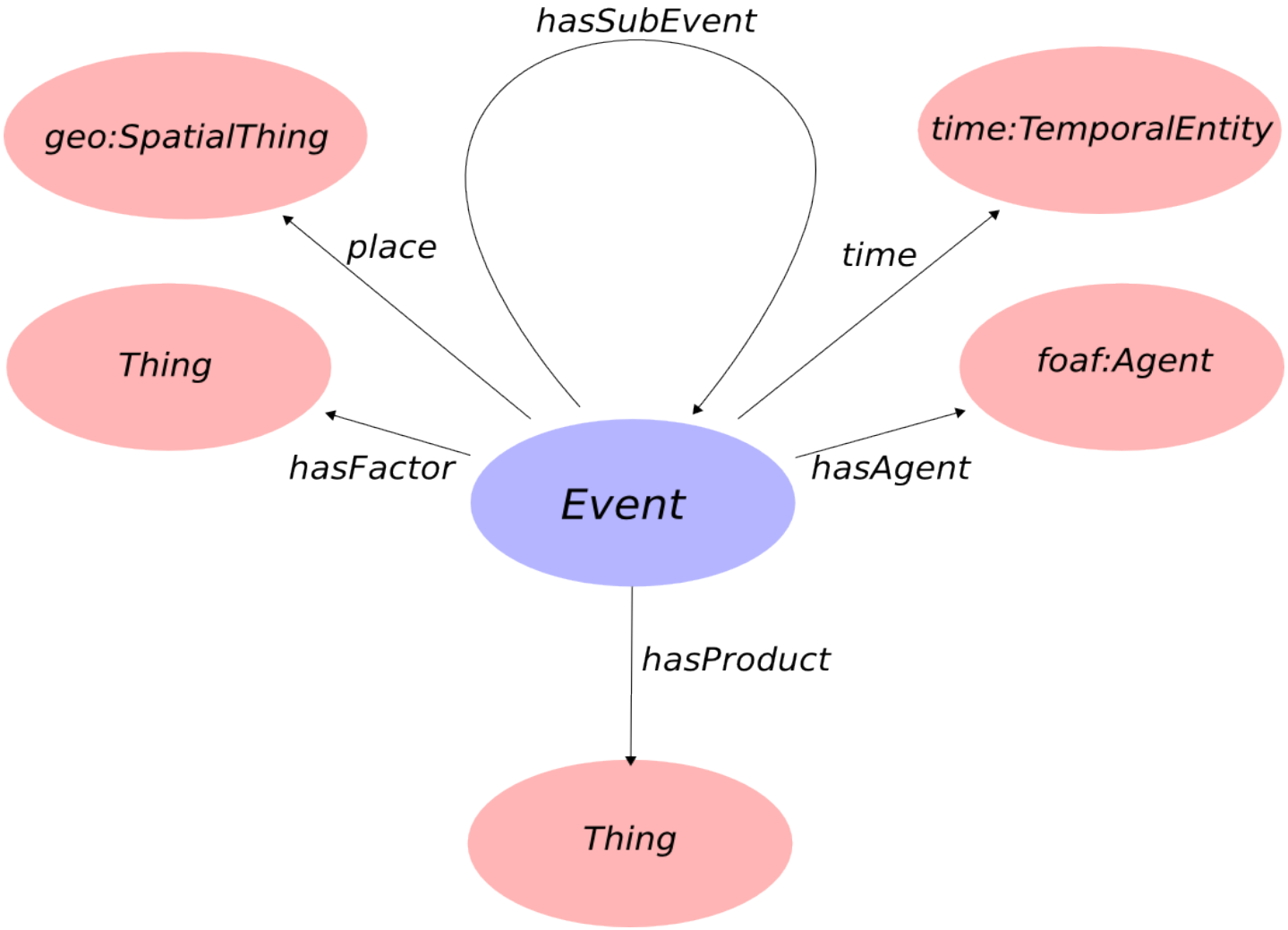
"This performance happened the 9th of March, 1984"
"This beat is occurring around sample 32480"
"The second verse is just before the second chorus"
...

Only four concepts: **Instant**, **Interval**, **TimeLine** (and **TimeLineMap**)



The Event ontology

We need a way to classify space/time regions :
Performances, recordings, beats, verses, composition, ...



FRBR + FOAF

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FRBR: Functional Requirements for Bibliographic Records

We use three FRBR concepts:

- **Work**
- **Manifestation**
- **Item**

The **Expression** concept seemed to fuzzy for being used:
whole *workflow* between a work and its manifestation

FOAF: Friend-of-a-friend

- **Person**
- **Group**
- **Organization**

- ... and the relationship vocabulary (married, brother of, etc.)

music ontology

Music *production* specific concepts

On top of FRBR:

MusicalWork, **MusicalManifestation** (**Album**, **Track**, **Playlist,** etc.)
MusicalItem (**Stream**, a particular **Vynil**, etc.)

On top of FOAF:

MusicArtist and **MusicGroup** (defined classes)
Arranger, **Engineer**, **Performer**, **Composer**, etc. (same thing)

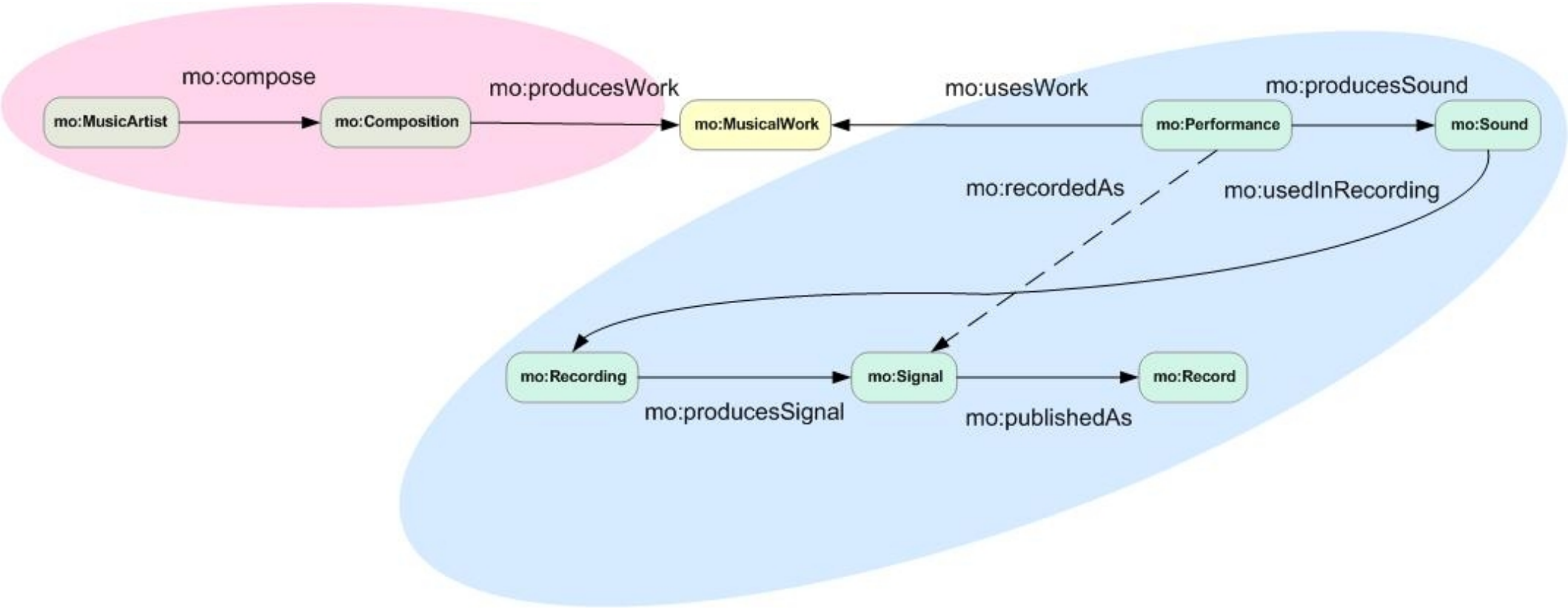
On top of the Event ontology:

Composition, **Arrangement**, **Performance**, **Sound**, **Recording**

Others:

Signal, **Score**, **Genre**, **Instrument**, etc.

Workflow information



Levels of expressiveness

Flexibility of the ontology

- Level 1: **purely editorial**

  "This track is on that particular album and that compilation and was created by that artist"

- Level 2: **introducing events**

  "This is a recording of this particular musician playing that jazz-rock arrangement of that particular piece"

- Level 3: **introducing event decomposition**

  "In this performance, this key was played at this particular time by this person, who was playing the piano"

Extensions

Lots of **anchor points** (instrument, genre, signal, timeline, etc.)

Already several extensions available:

- **Musical feature ontology**: uses **Event** as a way to classify features on a signal' timeline
- **Instrument taxonomy**: thanks to Musicbrainz!
- **Genre taxonomy**: thanks to Wikipedia/DBPedia!
- **The Key ontology**

Other possible extensions:

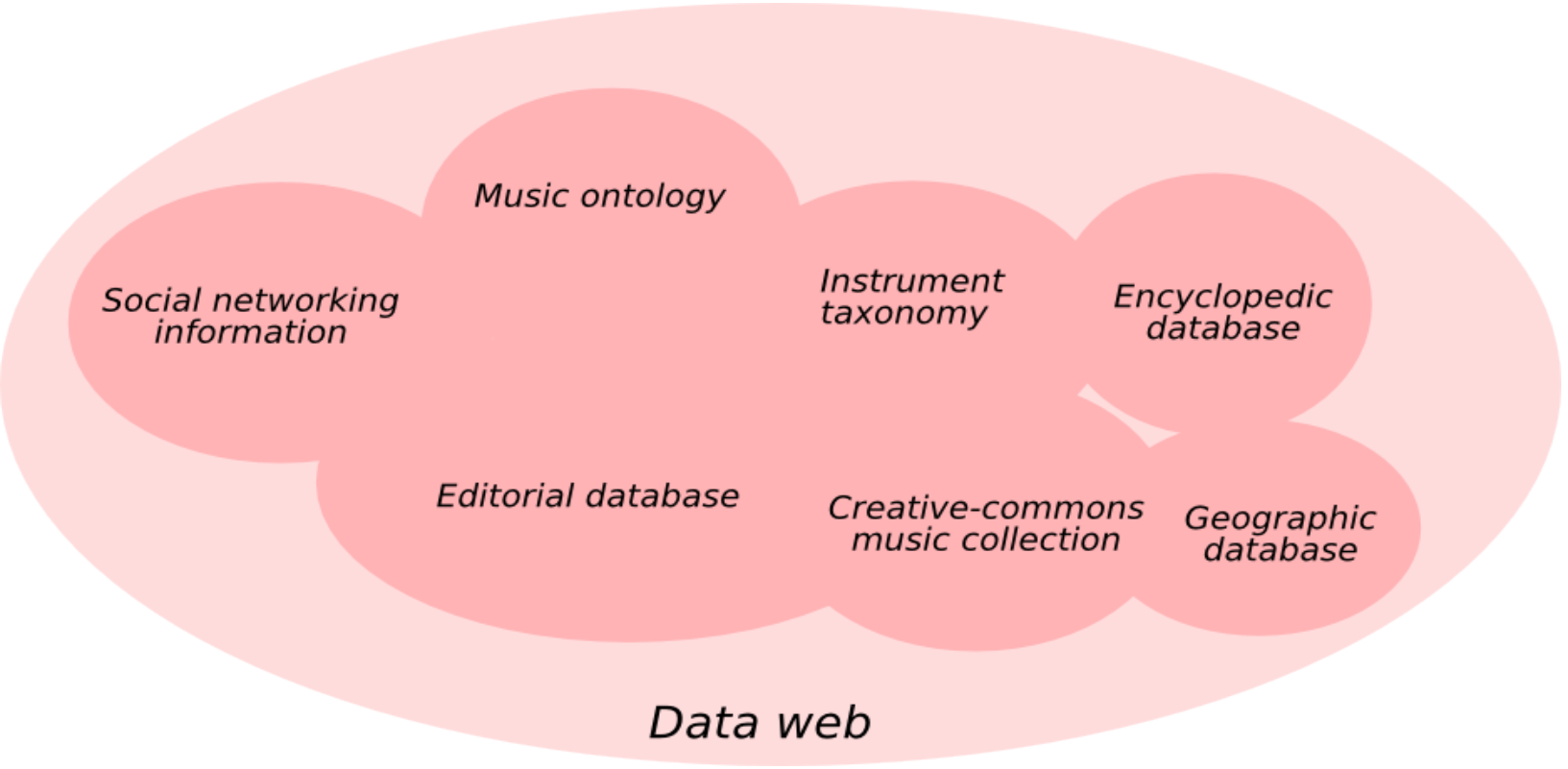
- Audio recording devices under the **Recording** concept?
- **Mixing** events dealing with **Signal** objects?
- Sound cognition under the **Sound**/**Listener** concepts?
- Symbolic music notation under **Score**?
- Chord ontology?

Linking open data on the Semantic Web

W3C' Semantic Web Education and Outreach community project

Lots of *open data* available: Wikipedia, Geonames, Musicbrainz, creative commons repositories, etc.

Let's interlink them using Semantic Web technologies: DATA MASHUPS



So far:
- Jamendo
- Magnatune
- Musicbrainz
- DBPedia
- GeoNames
- RDF book mashup
- ...

And now??

Management of audio collections and enhanced access:

- Your audio files are just other **items** of a particular **manifestation**, which has an URI
- Store the corresponding statements in your SW-enable application
- And your collection gets access to the whole web of knowledge (well, in its current state:-))

Give me all musical works composed in a city with more than 500 000 inhabitants

Is there someone nearby really liking this band and the same beer as me, so that we can have a drink tomorrow?

Place my collection on a timeline and make me listen something composed in the UK in 1560, followed by a rock song recorded in the 60s

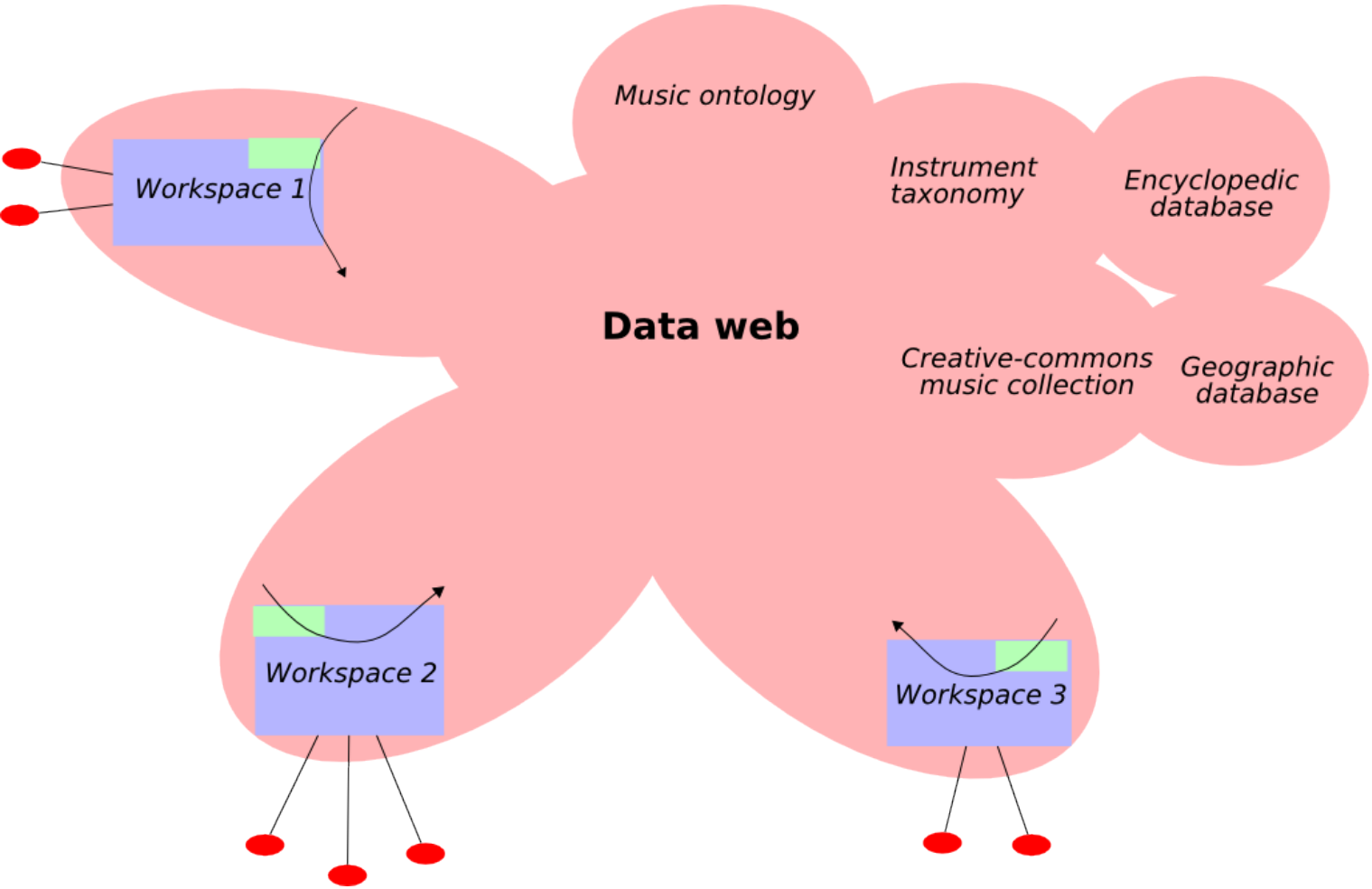
Give me all Jimmy Hendrix songs played by Brass Bands with at least 5 members

Are there any other performances of this work? Give me one with a small part at 120 bpm

***Semantic workspaces*:**

- This web of data is indeed a **machine-understandable cultural web**
- Let's use this artificial culture to make algorithms **smarter than they are**, and export resulting knowledge dynamically!

Semantic workspaces



: external data processing tools
: `semantic workspace'
: semantic-web client
: data web
: knowledge processing workflow

Thank you!!