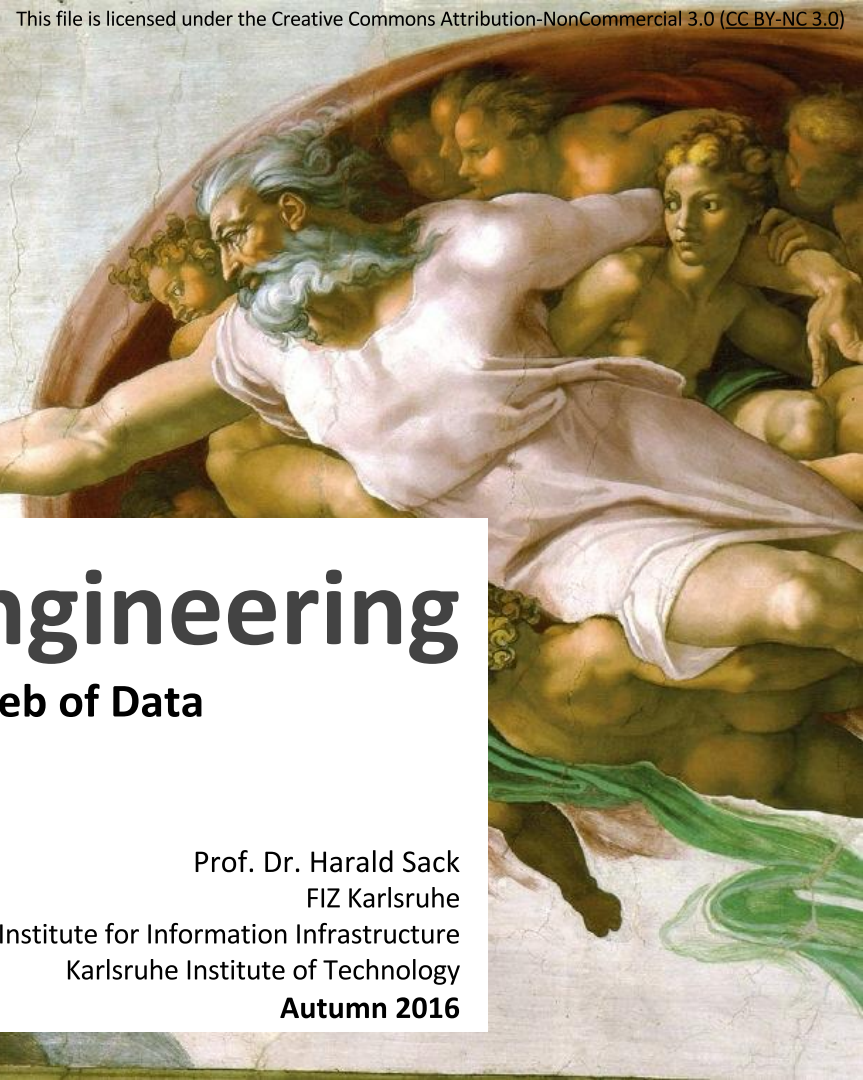




Lecture 1: Linked Data and the Web of Data

Leibniz Institute for Information Infrastructure
Karlsruhe Institute of Technology
Autumn 2016

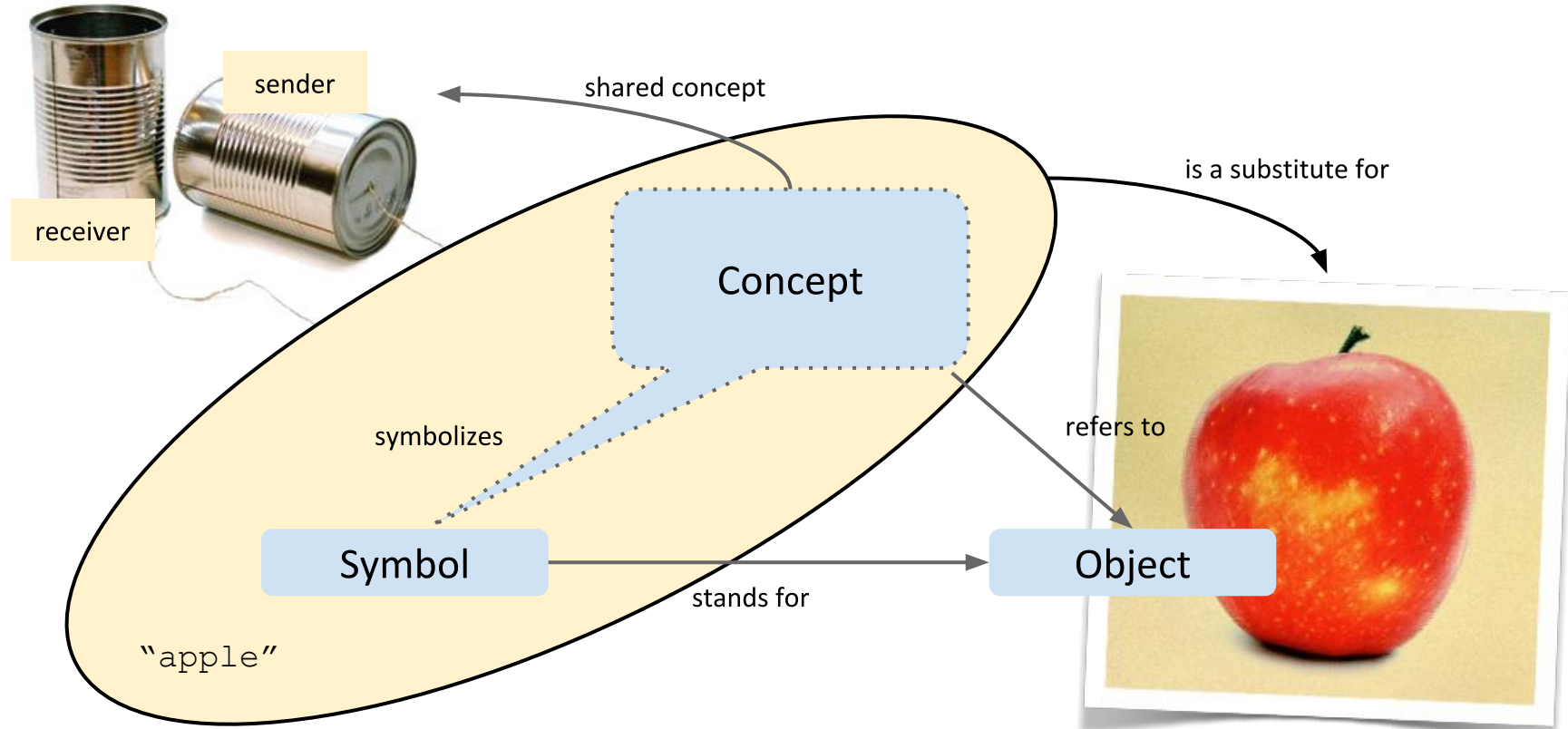
What is this?





Ceci n'est pas une pomme.

Semiotic Triangle



Rumplestitskin Principle



Knowing someone's, or something's, true name gives the person
(who knows the true name) power over them...

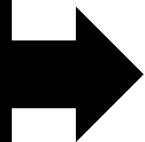
Uniform Resource Identifier

- A **Uniform Resource Identifier** (URI) defines a simple and extensible schema for worldwide unique identification of abstract or physical resources (RFC 3986).
- A **Resource** can be every object with a clear identity (according to the context of the application)
 - as e.g., web pages, books, locations, persons, relations among objects, abstract concepts, etc.
- URI concept is already established in various domains, as e.g.,
 - the Web (URL),
 - Books and publications (ISBN, ISSN),
 - Digital Object Identifier (DOI)

URL

identify
what exists
on the web

<http://www.mywebsite.org/>

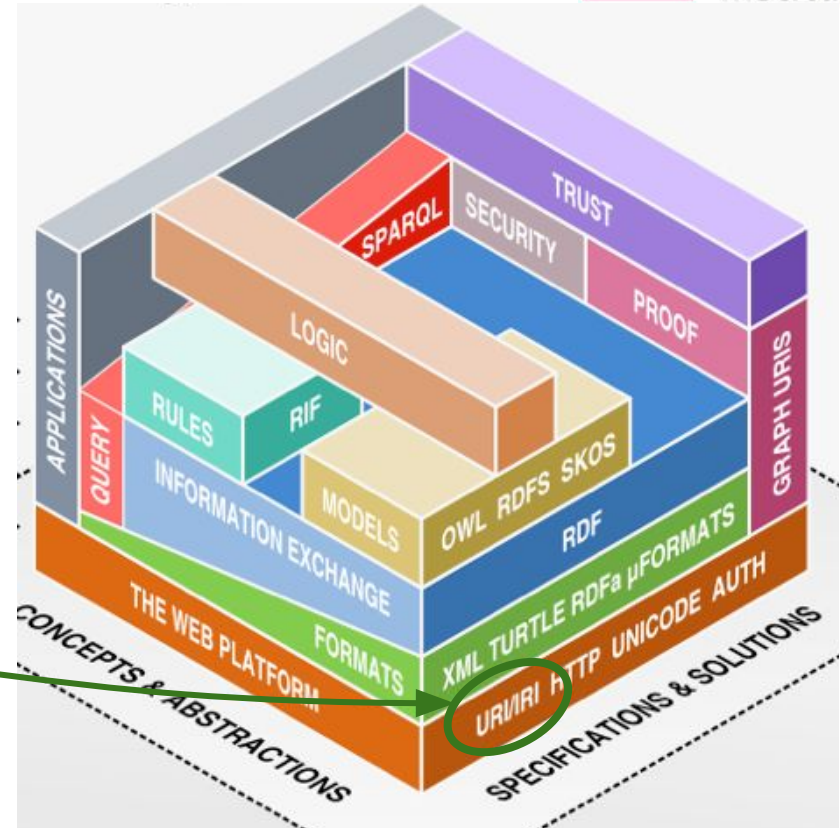
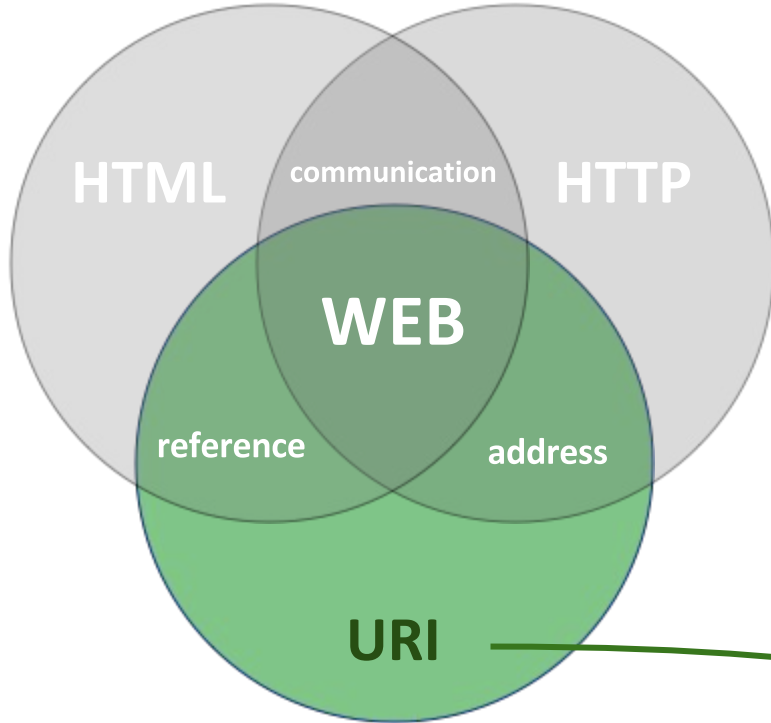


URI

identify
on the web
what exists

http://hpi.de/harald_foaf.rdf#me

Linked Data and the Web



URI

<http://www.tour-eiffel.fr/>

Resource

identifies

Presentation

represents (stands for)

Designatum

Representation

describes

defines

Designator

Metadata:

Content-type: text/html

Data:

```
<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.01
Transitional//EN" "http://www.w3.org/TR/html4/loose.dtd">
<html>
  <head>
    <title>Le site officiel de la Tour Eiffel</title>
    ...
  </html>
```

The Eiffel Tower is described
(designated) by the web page

What if a URI does not exist (yet)?

- Define a URI by yourself:
 - **avoid overlaps** → use your own website as namespace
 - enable **documentation at the same place** → HTTP Content Negotiation
- Use **separate URIs** for the **resource (*Designatum*)** and **its documentation (*Designator*)** via
 - HTTP Content Negotiation and/or
 - URI references (e.g. via "#" fragment identifier)

HTTP Content Negotiation

Let's try an example:

- I want to have **information** about the Eiffel Tower from DBpedia

1 HTTP GET request
Accept Header: text/html

http://dbpedia.org/resource/Eiffel_Tower

URI represents *Designatum*

2 HTTP/2 303 See Other

http://dbpedia.org/page/Eiffel_Tower

3 HTTP GET request
Accept Header: text/html

URI represents *Designator*

4 HTML Document

http://commons.wikimedia.org/wiki/File:Eiffel_tower_from_trocadero.jpg

HTTP Content Negotiation

Let's try another example:

- I want to have **machine readable information** about the Eiffel Tower from DBpedia

1 HTTP GET request
Accept Header: application/rdf+xml

http://dbpedia.org/resource/Eiffel_Tower

URI represents *Designatum*

2 HTTP/2 303 See Other

http://dbpedia.org/data/Eiffel_Tower

URI represents *Designator*

3 HTTP GET request
Accept Header: application/rdf+xml

4 RDF Document



http://commons.wikimedia.org/wiki/File:Eiffel_tower_from_trocadero.jpg

HTTP Content Negotiation

Let's try it ourselves:

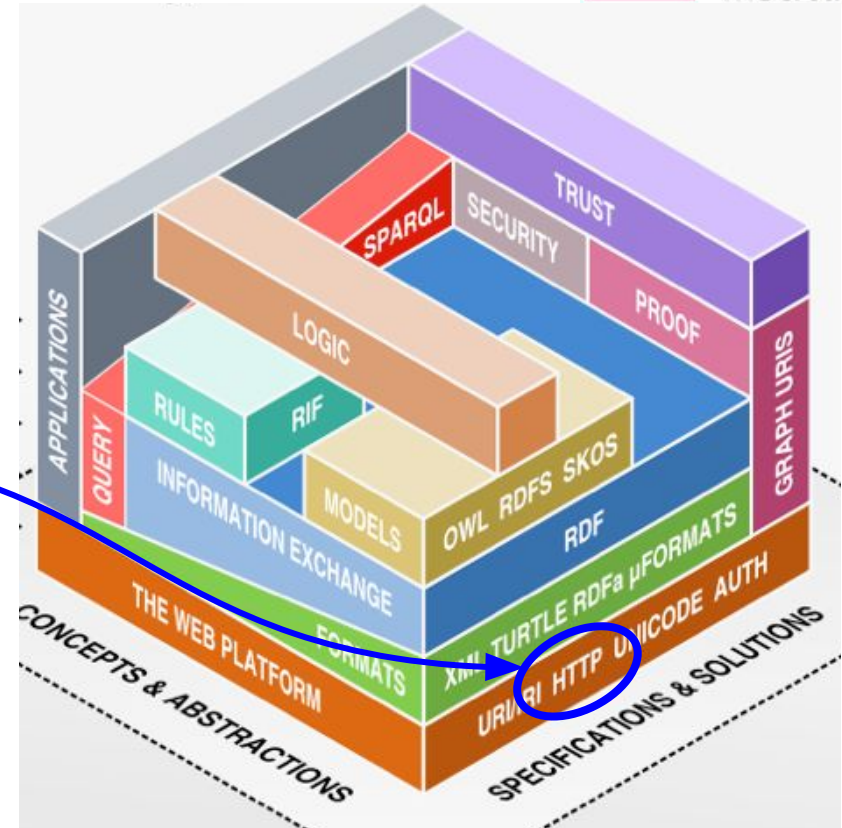
- I want to have **information** about the Eiffel Tower from DBpedia

```
curl -L -H "Accept: text/html" http://dbpedia.org/resource/Eiffel_Tower
```

- I want to have **machine readable information** about the Eiffel Tower from DBpedia

```
curl -L -H "Accept: application/rdf+xml" http://dbpedia.org/resource/Eiffel_Tower
```


HPI Hasso Plattner Institut



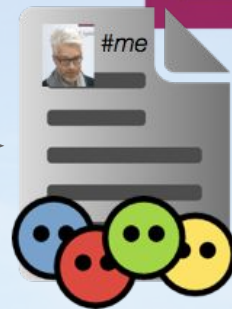
Fragment Identifier

Let's try another example:

- I want to have **machine readable information** about myself

http://hpi.de/harald_foaf.rdf

Designator



FOAF Document
with information about me

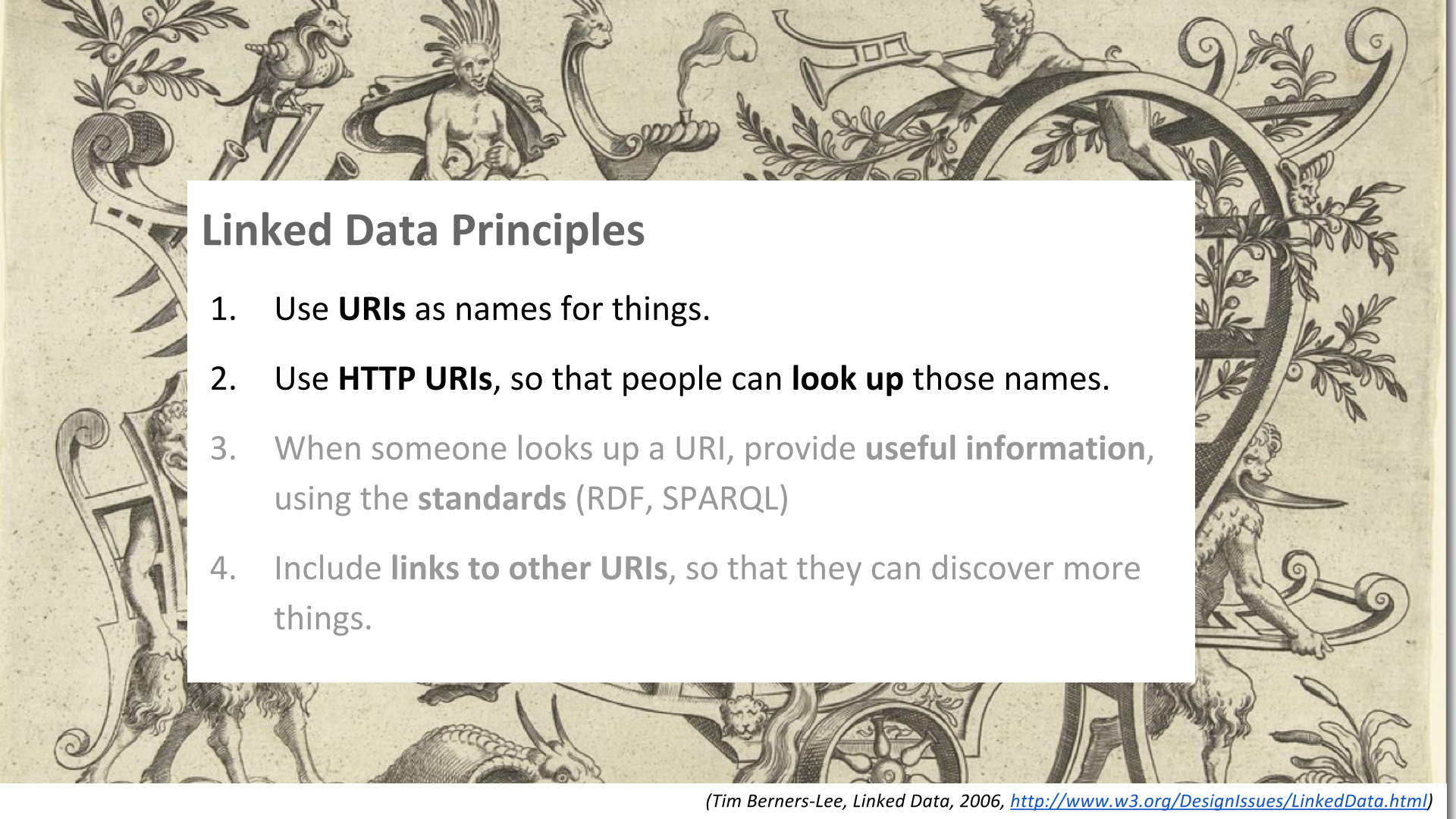
http://hpi.de/harald_foaf.rdf #me

Designatum

identifies me



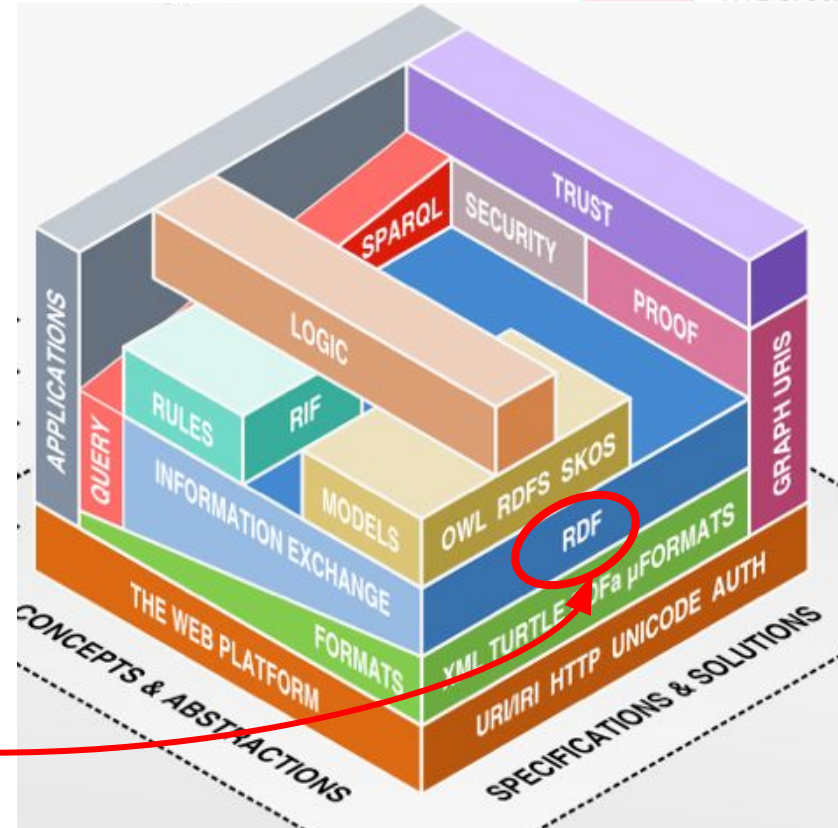
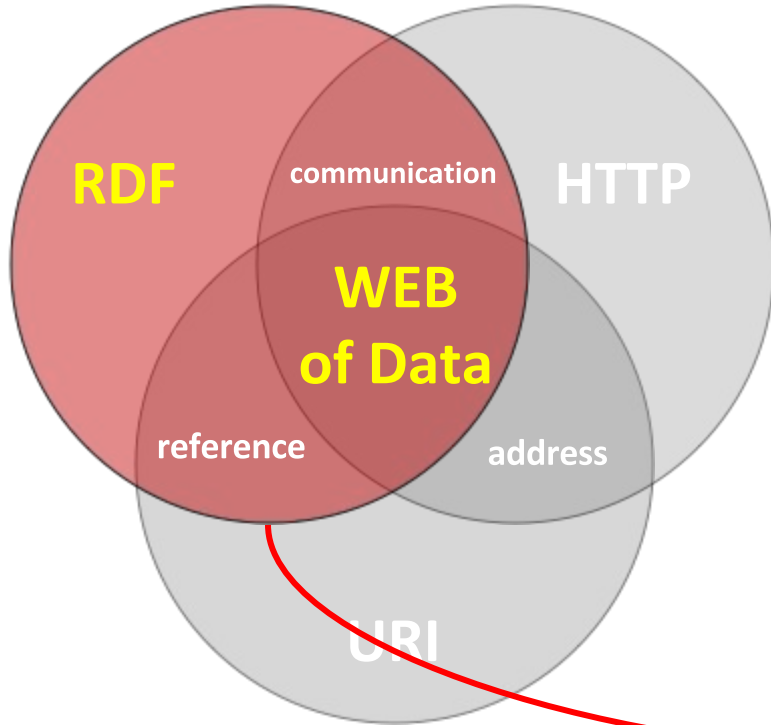
http://commons.wikimedia.org/wiki/File:Eiffel_tower_from_trocadero.jpg

The background of the slide is a detailed, sepia-toned illustration. It features a variety of figures and symbols: a unicorn-like creature on the left, a figure with a large feathered headdress in the center, a hand holding a smoking pipe, a figure playing a trumpet, and a figure with a long, curved horn. The scene is framed by elaborate, swirling acanthus leaves and scrolls.

Linked Data Principles

1. Use **URIs** as names for things.
2. Use **HTTP URIs**, so that people can **look up** those names.
3. When someone looks up a URI, provide **useful information**, using the **standards** (RDF, SPARQL)
4. Include **links to other URIs**, so that they can discover more things.

Linked Data and the Web





Lecture 2: RDF and RDFS

OpenHPI - Linked Data Engineering