

URI's

A CTS2 Perspective

Subject URI vs. Description

- Subject URI references what is being described
- Description is result of a URL Resolution:

curl <http://informatics.mayo.edu/cts2/services/sct/cts2/entity/74400008?format=owl>

curl <http://www.w3.org/TR/2003/PR-owl-guide-20031209/wine#WhiteBurgandy>

Or a Query:

<prefix wine: <http://www.w3.org/TR/2003/PR-owl-guide-20031209/wine#>>.

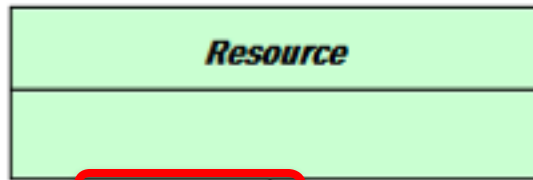
SELECT ?p ?o

WHERE {wine:WhiteBurgandy ?p ?o}.

About URI Namespace

- <http://www.w3.org/TR/2003/PR-owl-guide-20031209/wine#WhiteBurgandy>
 - Happens to appear in ‘the’ Wine ontology
 - But which one is “the” wine ontology?
 - HTTP GET gives a 301 to:
 - <http://www.w3.org/TR/2003/PR-owl-guide-20031215/wine>
 - Same ontology can be found at many URL’s
 - ... in many formats
 - WhiteBurgandy can be a subject in any ontology
 - Note that PR-owl-guide-20031209/wine#WhiteBurgandy is *not* the 12/9/2003 description of WhiteBurgandy – it is the de-facto URI, probably read as “first described in 2003...”

class ResourceDescription



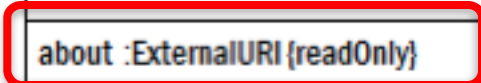
← NOT in model



/description 0..*

Changeable

ResourceDescription



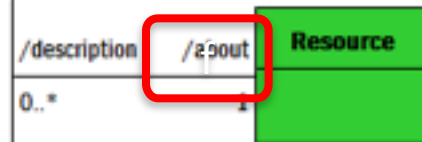
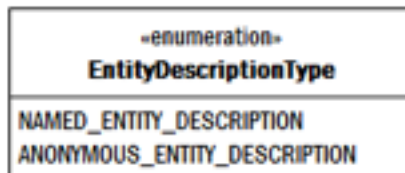
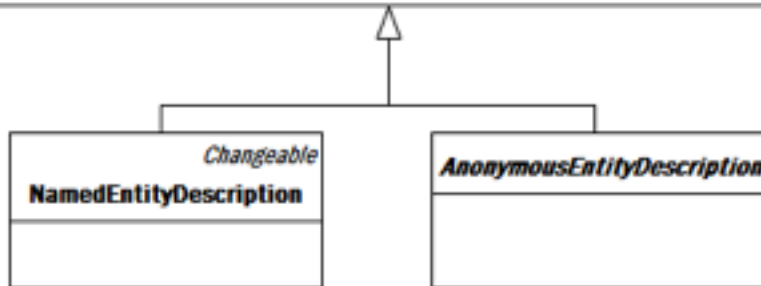
about :ExternalURI {readOnly}
describedResourceType :CTS2ResourceType {readOnly}
resourceID :LocalIdentifier {readOnly}
formalName :String [0..1]
keyword :String [0..*]
resourceType :URIAndEntityName [1..*]
resourceSynopsis :EntryDescription [0..1]
additionalDocumentation :PersistentURI [0..*]
sourceAndRole :SourceAndRoleReference [0..*]
rights :OpaqueData [0..1]
note :Comment [0..*]
property :Property [0..*]
alternateID :ExternalURI [0..*]
sourceStatements :StatementDirectoryURI [0..1] {readOnly}
::Changeable
entryID :PersistentURI {readOnly}
entryState :EntryState
status :StatusReference [0..1]

«enumeration»

CTS2ResourceType

CODE_SYSTEM
CODE_SYSTEM_VERSION
CONCEPT_DOMAIN
MAP
MAP_VERSION
VALUE_SET
VALUE_SET_DEFINITION

class EntityDescription



NOT in model

The Problem

Once we agree that the URI of the description is *not* the same as the URI of the thing being described...

... how do we agree on the URI of the thing being described?

- DNS Names
 - PURLs
 - W3.org
 - ...
- ISO OIDS
- Digital Object Identifiers
- Life Science Id's

The Problem

Appendicitis in SNOMED-CT:

http://www.ihtsdo.org/SCT_74400008- perl OWL rendering

<http://purl.oclc.org/snomed/sct#id-74400008> - SNOMED CT in SKOS

<http://purl.bioontology.org/ontology/SNOMEDCT/74400008> - BioPortal

<urn:oid:2.16.840.1.113883.6.96.74400008> – One solution to the OID problem

<urn:oid:2.16.840.1.113883.6.96:74400008> – another

... many more can be uncovered...

Proposed Solution

1. Use HTTP URI scheme – machinery in place, everyone knows how to use
2. Namespace should be owned by primary author
 - <http://snomed.info/> - IHTSDO
 - <http://who.int/> - World Health Organization
 - <http://hl7.org/> - HL7
 - <http://w3.org/> - W3C
 - <http://nlm.nih.gov/> - NLM
 - ...

Proposed Solution (continued)

3. If author cannot (or will not) mint URI's, use a trusted secondary resource (w3.org, nlm.nih.gov, ...)
4. If URI's are already well known and accepted (dublin core being a primary example), keep them in place.

Proposed Solution (continued)

5. Primary author should respond to a URI with one of:

- 200 accompanied by a simple message that “yes this is a valid URI for X” and (possibly) for more information see: ``
- 303 (See Other) and point at the URI of a description
- Should NOT resolve to a full OWL / XML / ... description

Benefits of Proposed Solution

Anyone can publish directories...

... <urn:oid:2.16.840.1.113883.6.96.74400008> →

<http://snomed.info/id/74400008>

Because the result can be validated via ican:

<http://snomed.info> - owned by IHTSDO representative

And a dereference (should) give information

Example: <http://id.who.int/icd/entity/146752202>

CTS2 Solution to Multiple Identifiers

- `http://{service}/codesystembyuri?uri=2.16.840.1.113883.6.96`
- `http://{service}/codesystembyuri?uri=http://www.ihtsdo.org/SCT`
- `http://{service}/codesystembyuri?uri=http://snomed.info/sct/9000000000000207008`

-> All redirect to

`http://{service}/codesystem/SNOMED_CT/`

CTS2 Response

```
<?xml version="1.0" encoding="UTF-8"?>
<CodeSystemCatalogEntryMsg xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:schemaLocation="http://www.omg.org/spec/CTS2/1.1/CodeSystem http://informatics.mayo.edu/cts2/spec/CTS2/1.1/
codesystem/CodeSystem.xsd"
xmlns="http://www.omg.org/spec/CTS2/1.1/CodeSystem"
xmlns:core="http://www.omg.org/spec/CTS2/1.1/Core">
  <core:heading>
    <core:resourceRoot>codesystem/SNOMED_CT</core:resourceRoot>
    <core:resourceURI>http://informatics.mayo.edu/cts2/services/sct/cts2/codesystem/SNOMED\_CT</core:resourceURI>
    <core:accessDate>2013-05-15T15:34:05Z</core:accessDate>
  </core:heading>
  <codeSystemCatalogEntry about="http://snomed.info/sct/90000000000207008" codeSystemName="SNOMED_CT"
formalName="SNOMED CT International Edition">
    <core:keyword>SNOMED</core:keyword>
    ...
    <core:alternateID>2.16.840.1.113883.6.96</core:alternateID>
    <core:alternateID>http://www.ihtsdo.org/SCT</core:alternateID>
    ...
```

Similar Solution for Entity (aka Class, Concept)

- `http://{service}/entitybyuri?uri=http://www.ihtsdo.org/SCT_74400008`
- `http://{service}/entitybyuri?uri=http://snomed.info/id/74400008`

Would redirect to:

`http://{service}/codesystem/SNOMED_CT/
version/{version}/entity/74400008`

- AlternateID's in form of ns/name

Sample Response

```
<?xml version="1.0" encoding="UTF-8"?>
<EntityDescriptionMsg xmlns="http://www.omg.org/spec/CTS2/1.1/Entity" xmlns:core="http://www.omg.org/spec/CTS2/1.1/Core">
  <core:heading>
    <core:resourceRoot>codesystem/SNOMED_CT/version/20130131/entity/74400008</core:resourceRoot>
    <core:resourceURI>http://informatics.mayo.edu/cts2/services/sct/cts2/codesystem/SNOMED\_CT/version/20130131/entity/74400008</core:resourceURI>
    <core:accessDate>2013-05-15T17:24:30Z</core:accessDate>
  </core:heading>
  <EntityDescription>
    <classDescription entryState="ACTIVE" about="http://snomed.info/id/74400008" descriptionState="FULLY_DEFINED">
      <entityID>
        <core:namespace>sctid</core:namespace>
        <core:name>74400008</core:name>
      </entityID>
      <alternateEntityID uri="http://www.ihtsdo.org/SCT\_74400008">
        <core:namespace>snomed</core:namespace>
        <core:name>SCT_74400008</core:name>
      </alternateEntityID>
      <alternateEntityID uri="2.16.840.1.113883.6.96:74400008">
        <core:namespace>oid</core:namespace>
        <core:name>74400008</core:name>
      </alternateEntityID>
      <describingCodeSystemVersion>
        <core:version href="http://informatics.mayo.edu/cts2/services/sct/cts2/codesystem/SNOMED_CT/version/20130131" uri="http://snomed.info/sct/900000000000207008/version/20130131">SNOMED_CT_20130131</core:version>
        <core:codeSystem href="http://informatics.mayo.edu/cts2/services/sct/cts2/codesystem/SNOMED_CT" uri="http://snomed.info/sct/900000000000207008">SNOMED_CT</core:codeSystem>
      </describingCodeSystemVersion>
      <designation assertedInCodeSystemVersion="SNOMED_CT_Spanish_Edition_20121031" externalIdentifier="1025274019" designationRole="PREFERRED">

```


Description URI



About URI



Alternate Identifiers (uri attribute is not Part of current CTS2 spec)



Namespace/Name

<http://foo.org/ontology#subject>:

<http://foo.org/ontology> #subject

[http://foo.org/ontology#](http://foo.org/ontology#subject) subject

<http://foo.org/ontology> subject

foo.org/ontology/text/plain?

Urn:oid:2.16.840.1.113883.6.96.240007?

CTS2 Solution

- Namespace is local to service instance

<http://snomed.info/id/> sctid (or sct or..)

EntityReference consists of:

URI: <http://snomed.info/id/74400008>

Ns: sctid (opt)

Name: 74400008 (opt)

Designation: Appendicitis (opt)

Possible URI's for sample FIBO Individual

- <http://www.omg.org/spec/IEF/IEPV/IEPPV/20130520/IEPPZ1-0#AdvancedSystemsManagementGroupLtd>
- <http://www.omg.org/spec/IEPPV/id/AdvancedSystemsManagementGroupLtd>
- <http://fibo.org/id/IEPPV/AdvancedSystemsManagementGroupLtd>

Notes

- Demonstrate issues involving versioning in URI's
 - Parsing URI's themselves
 - SameAs assertions
 - Other solutions
- Show existing solutions:
 - SKOS / Wine
 - SNOMED CT / WHO
- Differentiate XMI / XSD / XSLT (where software knows similarities) and ontologies
- Propose solution(s) including technical requirements
- Show CTS redirect solution for versioning...