FHIR Datatypes OWL Mapping

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Introduction

While a general mapping of profile entity type to OWL class is expected, the treatment of FHIR primitive types is worth consideration. The TopQuadrant mapping from XSD to Ontology introduces xsd:string and other types as classes which means that the payload must represent them as individuals (whether named or blank nodes).

The approach in Protégé is investigated where the xsd:string is a Built in datatype. The approach to adding FHIR primitive types as built in datatypes has not been researched and appears to require some special treatment.

Primitive types as Class expression

Assuming that we want the value of the primitive type to be the value of the range of the Data Property of the object, then we can express it as a built in datatype or as a data range expression. Of more importance is the use of this expression in the containing type (e.g. id) where the class is defined as a subclass of an anonymous class which has an optional id property of an id-primitive:

Here is an example (in Manchester Syntax) showing the FHIR Data type id:

```
Class: fhir:id
    Annotations:
        rdfs:comment "If the element is present, it must have either a @value, an @id referenced from
the Narrative, or extensions"@id referenced from the narrative, or extensions,
        rdfs:comment "A whole number in the range 0 to 2^64-1, optionally represented in hex, a uuid, an
oid or any other combination of lower-case letters a-z, numerals, &quot;-&quot; and &quot;.&quot;, with
a length limit of 36 characters"
    SubClassOf:
            Annotations: fhir:metatype "attribute",
                         rdfs:label "id-primitive"
        fhir:id.value max 1 (xsd:string[minLength 1] and xsd:string[pattern "[a-z0-9\\-\\.]{1,36}"]),
        fhir:Element
```

The expression has not been typed but can be named with a label. Facets are included which will have no effect on the reasoner but allow round trip of the definition.

Here is the same concept applied to fhir:Element which contains the id-primitive

```
Class: fhir:Element
    Annotations:
        rdfs:label "Element",
       rdfs:comment "The base element used for all FHIR elements and resources - allows for them to be
       extended with extensions"
    SubClassOf:
            Annotations: fhir:metatype "attribute",
                         rdfs:label "id-primitive"
       fhir:Element.id max 1 (xsd:string[minLength 1] and xsd:string[pattern "[a-z0-9\\-\\.]{1,36}"]),
        fhir:Element.extension some fhir:Extension
```

Thus this subclassOf statement which has the expression containing the Data range expression applies to all subclasses of Element.