4.3 Compatibility of OWL2 with RDF/RDFS

Ideally, OWL2 is an extension of RDF Schema, in the sense that OWL2 adopts the RDFS meaning of classes and properties (rdfs:Class, rdfs:subClassOf, etc.) and adds language primitives to support the richer expressiveness required. This approach would be consistent with the layered architecture of the Semantic Web (see figure 1.4).

Unfortunately, simply extending RDF Schema would work against obtaining expressive power and efficient reasoning. RDF Schema has some very powerful modeling primitives. Constructions such as rdfs:Class (the class of all classes) and rdfs:Property (the class of all properties) are very expressive and would lead to uncontrollable computational properties if the logic underlying OWL2 included these primitives in their generality.

4.3.1 Two Semantics

The full set of requirements for an ontology language seems unobtainable: efficient reasoning support does not exist for a language as expressive as a combination of RDF Schema with a full logic. Indeed, these requirements have prompted the successive W3C working groups to split OWL2 into two different sublanguages, each with a different underlying semantics geared toward fulfilling different aspects of the full set of requirements.[2]

4.3.1.1 OWL2 Full: RDF-Based Semantics

The entire language is called OWL2 Full and uses all the OWL2 language primitives. It also allows the combination of these primitives in arbitrary ways with RDF and RDF Schema. This includes the ability to change the meaning of the predefined (RDF or OWL2) primitives by applying the language primitives to each other. For instance,

[2]The first version of OWL included a third sublanguage, called “OWL Lite.” However, this language has been superseded by the “profiles” discussed in section 4.5.