

```

%prefix( lang: <http://purl.net/DOL/languages/>
           %% descriptions of languages ...
           trans: <http://purl.net/DOL/translations/> )%
           %% ... and translations

language lang:CommonLogiclang:OWL2_DL
language lang:CommonLogic
ontology Parthood_OWL =
  ObjectProperty: isProperPartOf
  SubPropertyOf: isPartOf
end
language lang:CommonLogic
ontology Parthood_CL =
  Parthood_OWL
  with translation trans:SROIQtoCL
then language lang:CommonLogic
  (if (and (isProperPartOf x y) (isProperPartOf y z))
       (isProperPartOf x z))
end

```

OWL can express transitivity, but not together with asymmetry.

7.3 Use Case Onto-2: Ontology Integration by Means of a Foundational Ontology

One major use case for ontologies in industry is to achieve interoperability and data integration. However if ontologies are developed independently and used within the same domain, the differences between the ontologies may actually impede interoperability. One strategy to avoid this problem is the use of a shared foundational ontology (e.g., DOLCE or BFO), which can be used to harmonize different domain ontologies. One challenge for this approach is that foundational ontologies typically rely on expressive ontology languages (e.g., Common Logic), while domain ontologies may be represented in languages that are optimized for performance (e.g., OWL EL). For this reason, currently the role of the foundational ontology is mainly to provide a conceptual framework that may be reused by the domain ontologies; further, watered-down versions of the foundational ontologies in OWL (like DOLCE-lite or the OWL version of BFO) are used as basis for the development of domain ontologies, be this as is, in an even less expressive version (e.g., a DOLCE-lite in OWL 2 EL), or only a relevant subset thereof (e.g., only the branch of endurants). A sample interplay between foundational and domain ontologies in various languages is depicted in Figure 8.2 below.

DOL provides the framework for integrating different domain ontologies, aligning these to foundational ontologies [?],[?] and combining the aligned ontologies into a coherent integrated ontology – even across different ontology languages. Thus, DOL enables ontology developers to utilize the complete, and most expressive, foundational ontologies for ontology integration and validation purposes.

The foundational ontology (FO) repository Repository of Ontologies for MULTiple USes (ROMULUS)⁴⁾ contains alignments between a number of foundational ontologies, expressing semantic relations between the aligned entities. For this use-case three such ontologies are considered, containing spatial and temporal concepts: DOLCE⁵⁾, GFO⁶⁾ and BFO⁷⁾, and present alignments between them using DOL syntax:

```

%prefix(
  gfo: <http://www.onto-med.de/ontologies/>
  dolce: <http://www.loa-cnr.it/ontologies/>
  bfo: <http://www.ifomis.org/bfo/>
  lang: <http://purl.net/DOL/languages/>
)

```

⁴⁾See <http://www.thezfiles.co.za/ROMULUS/home.html>

⁵⁾See <http://www.loa.istc.cnr.it/DOLCE.html>

⁶⁾See <http://www.onto-med.de/ontologies/gfo/>

⁷⁾See <http://www.ifomis.org/bfo/>