



# Towards Flexible, Incremental, and Paradigm-agnostic Consistency Checking in Multi-level Modeling Environments

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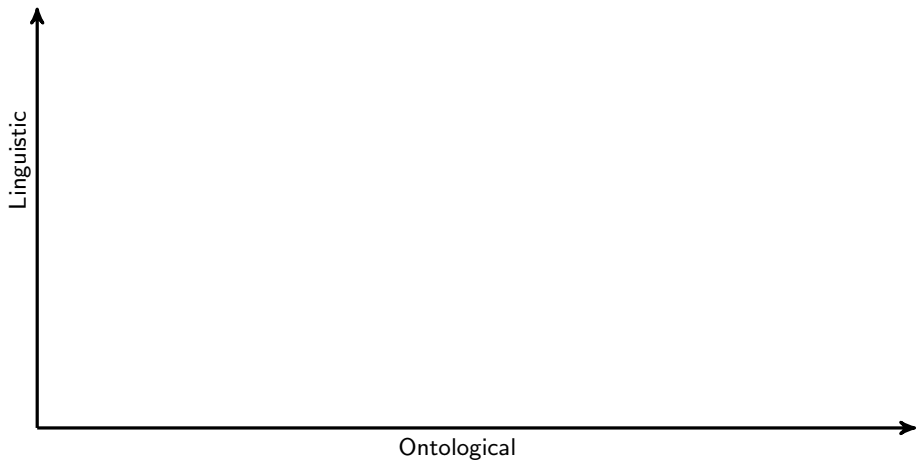


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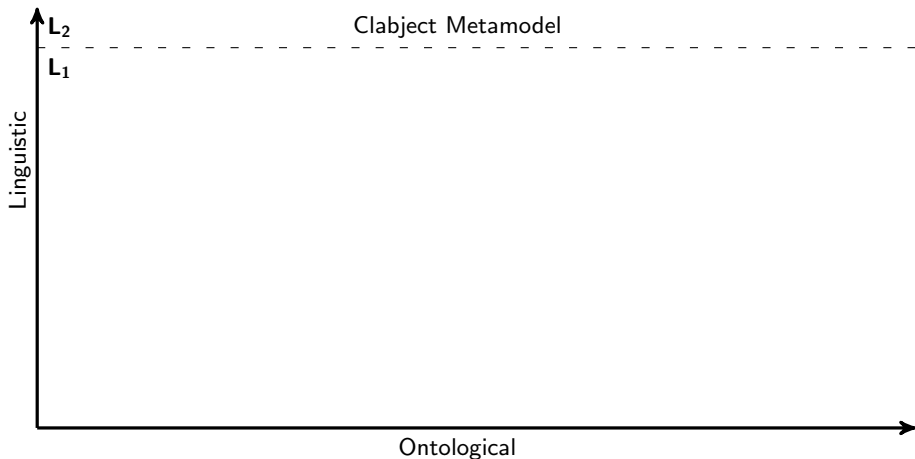
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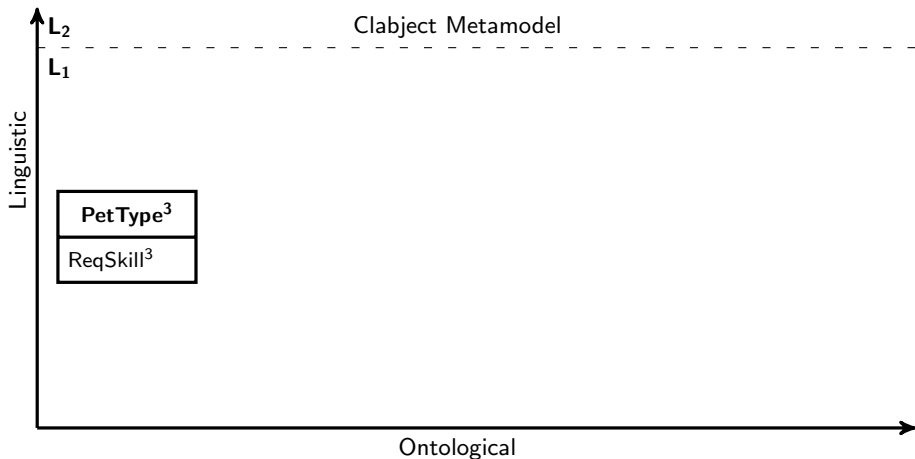


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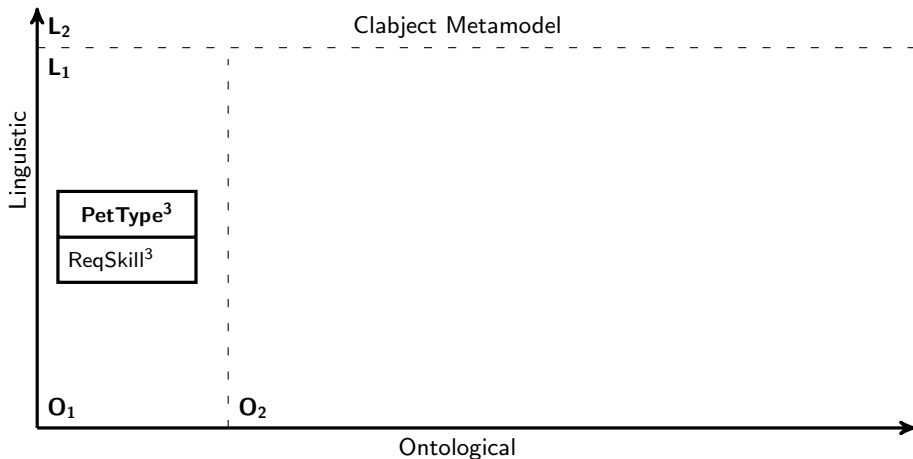
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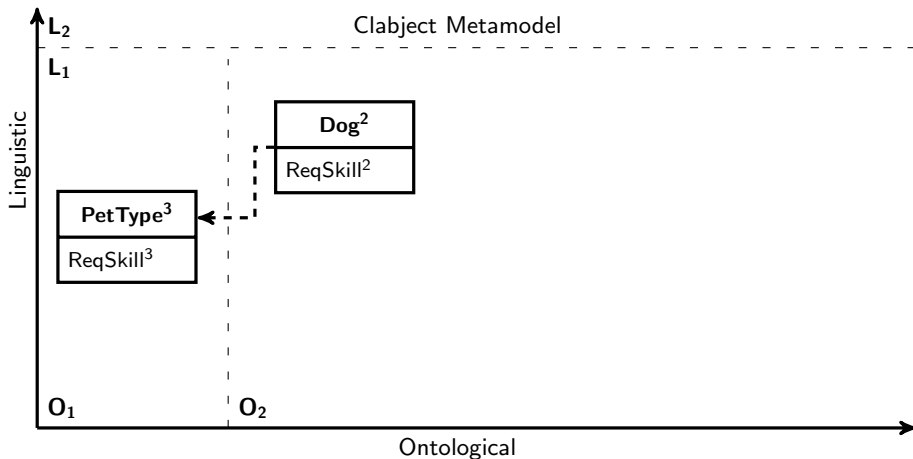
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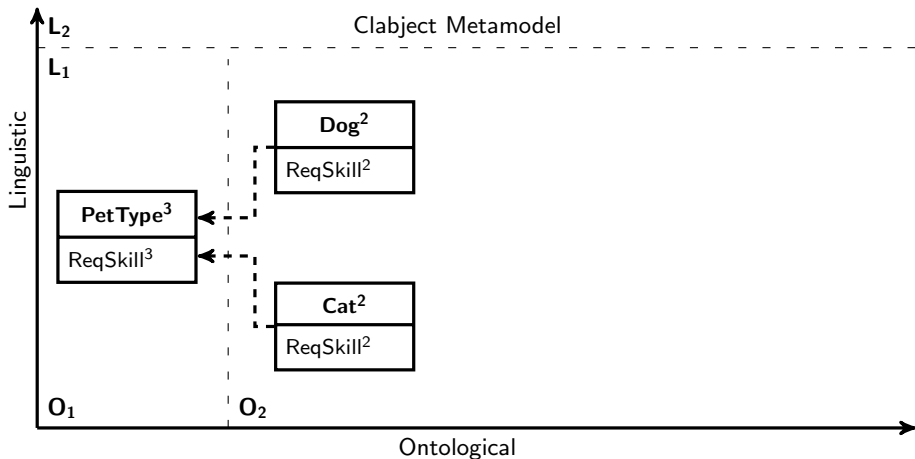


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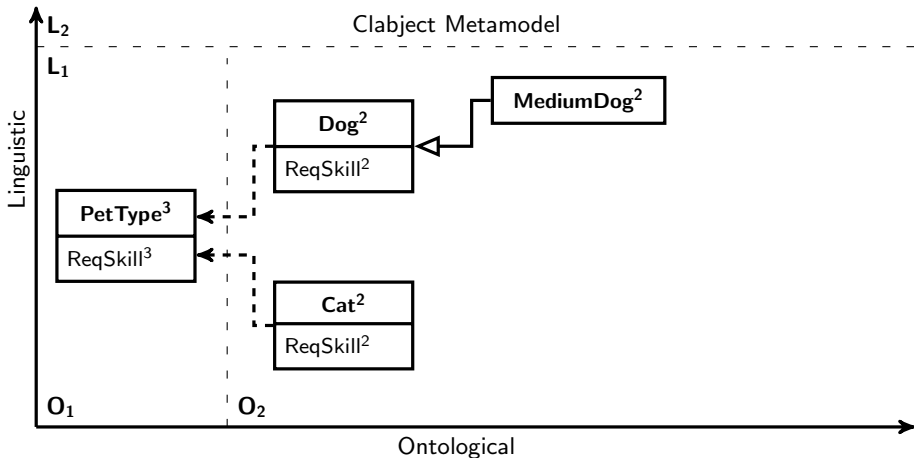


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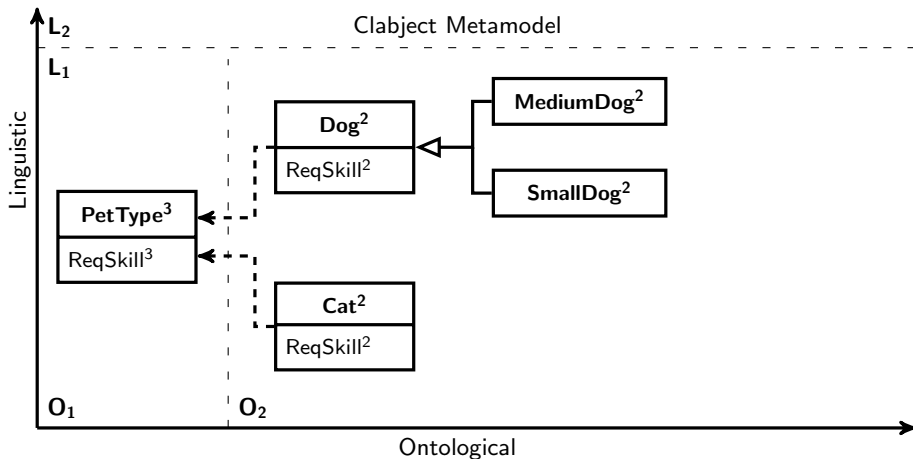




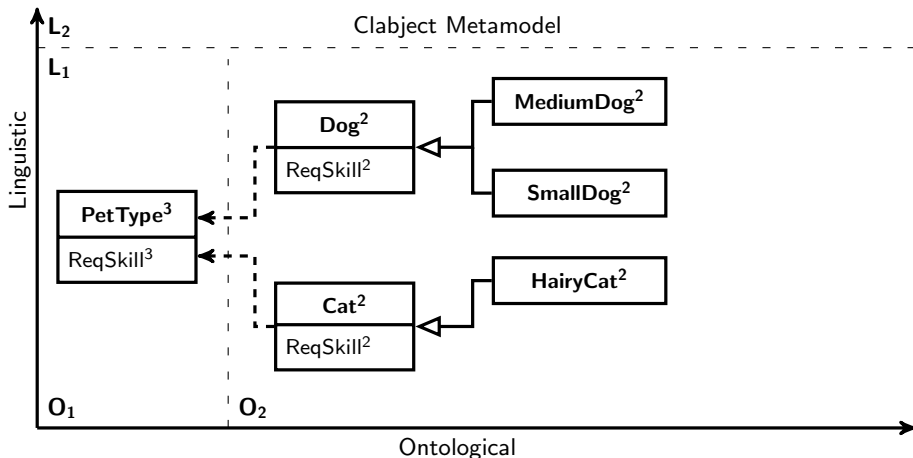
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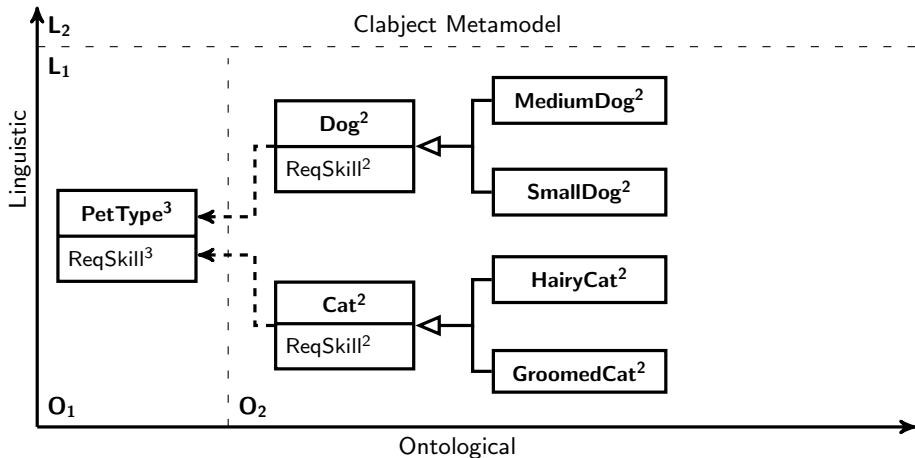
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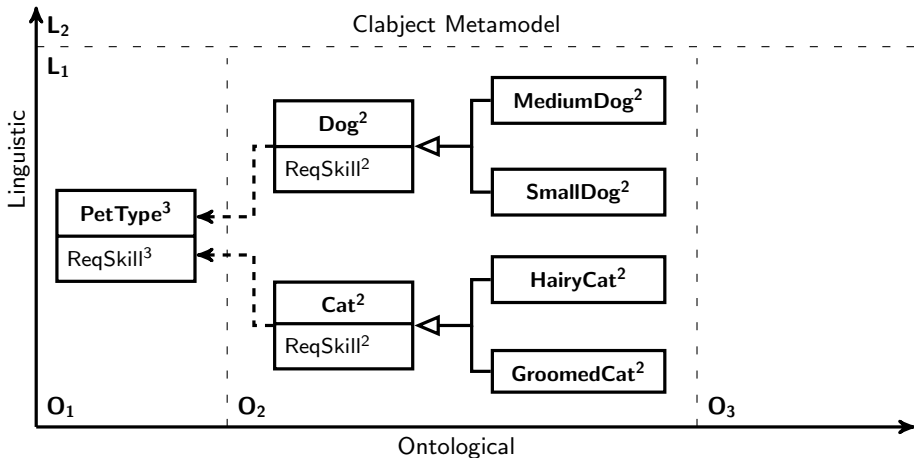
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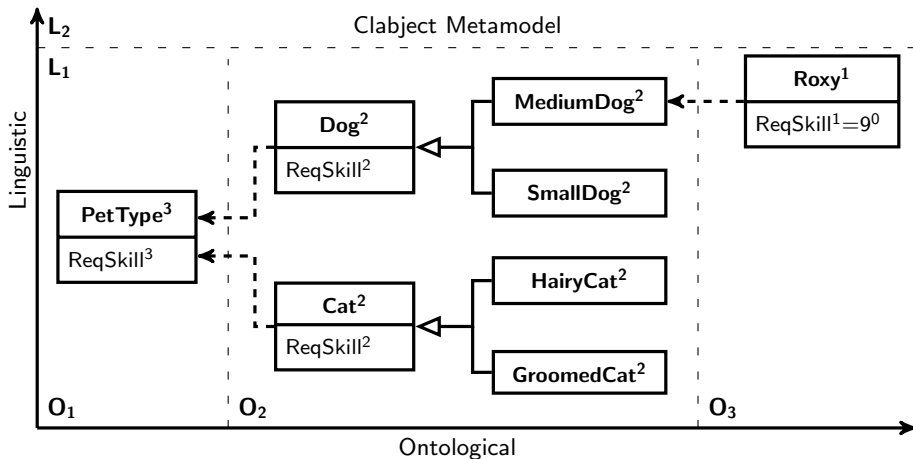
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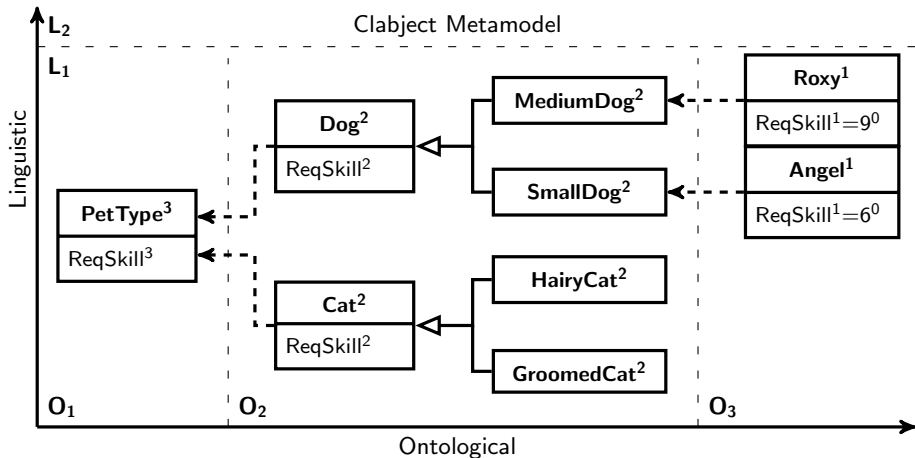
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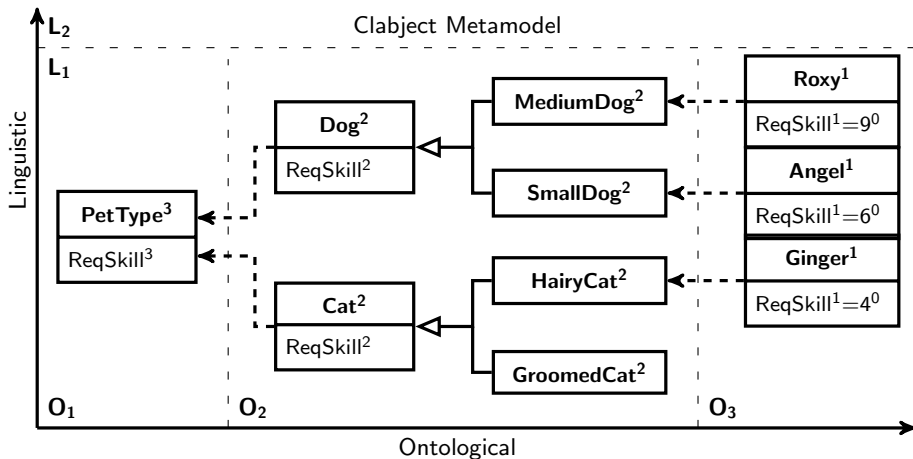
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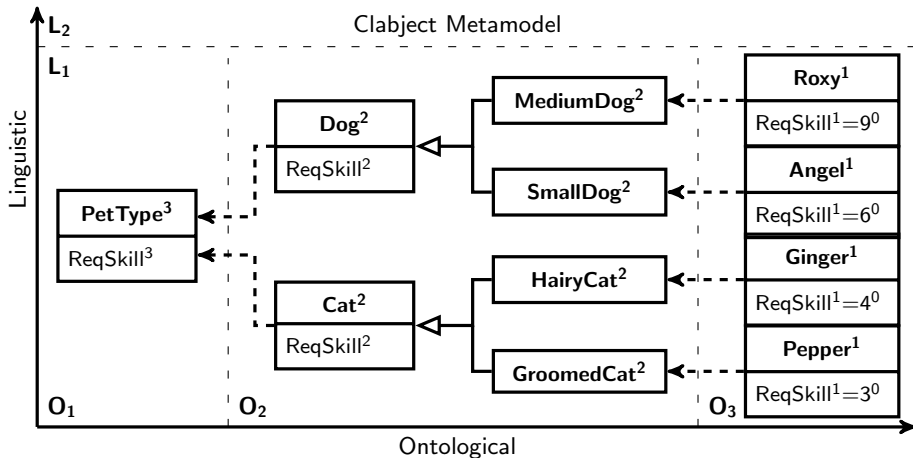


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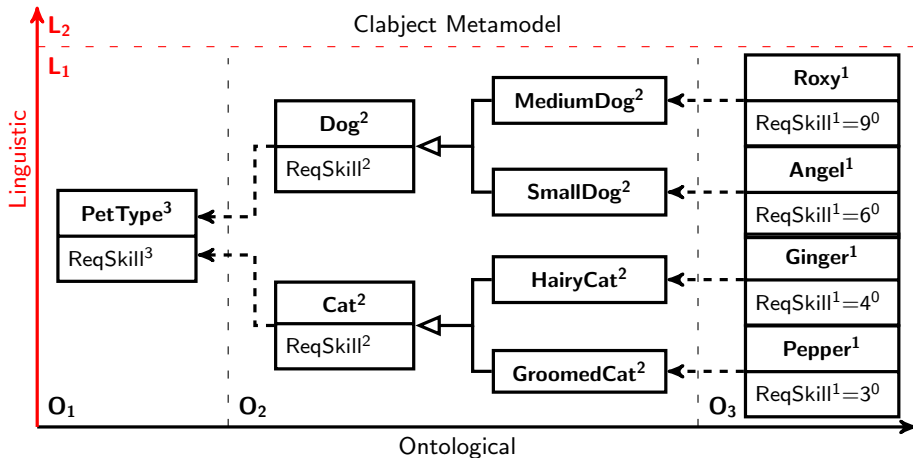




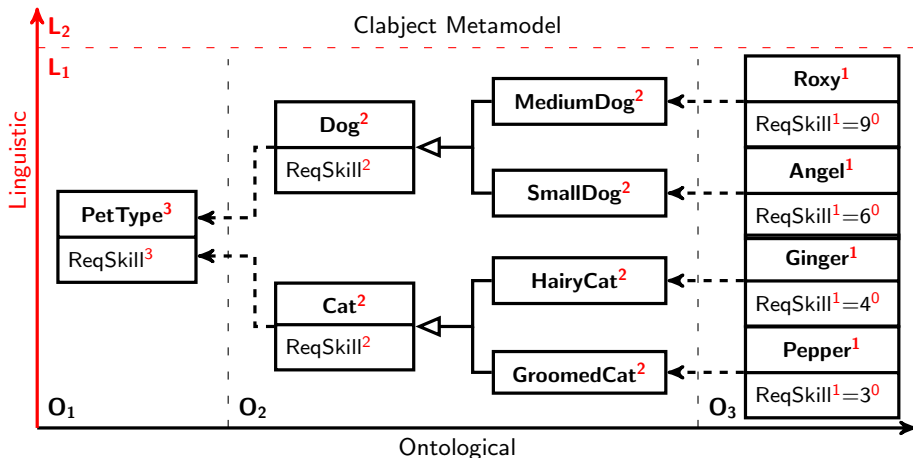
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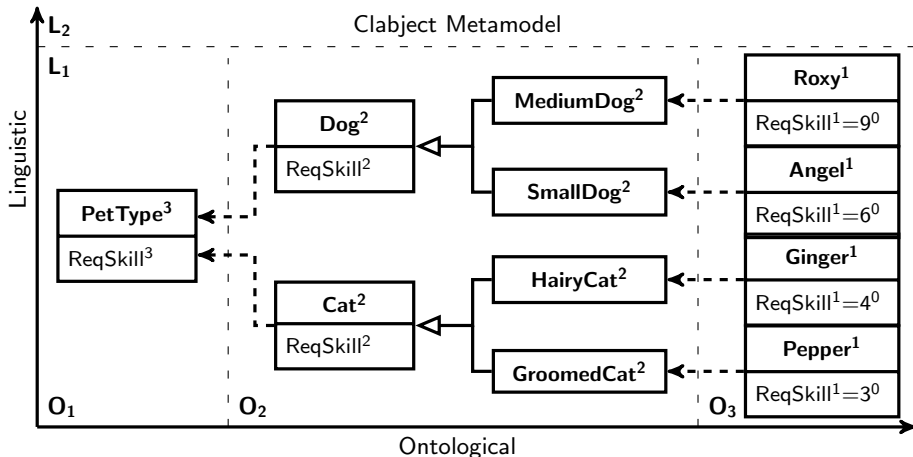
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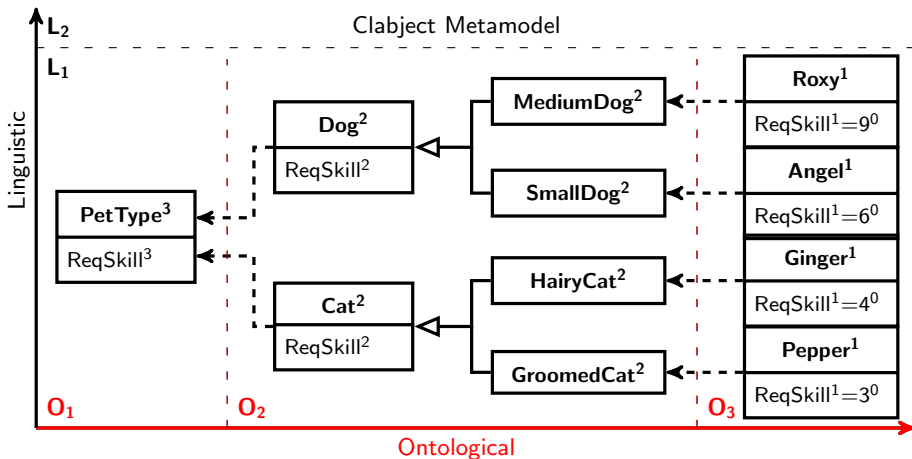
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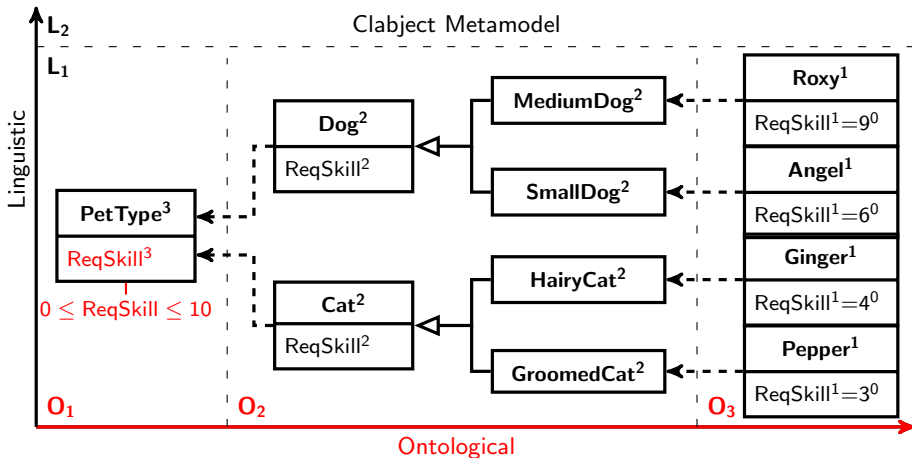
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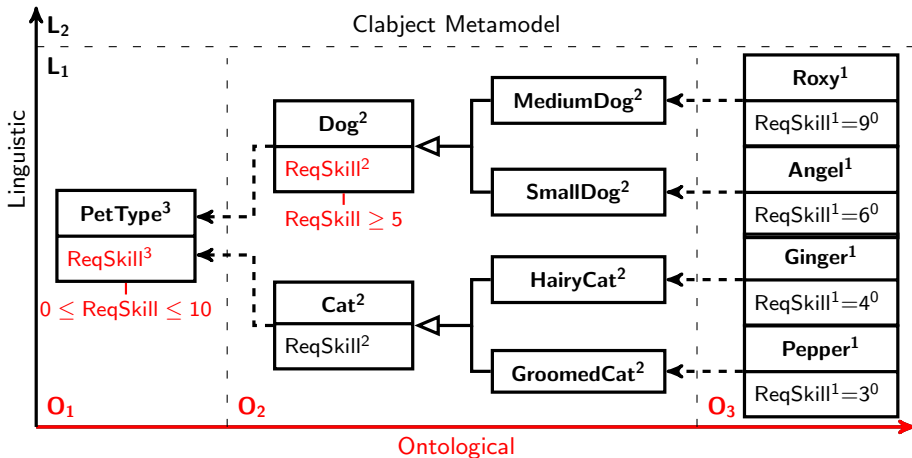
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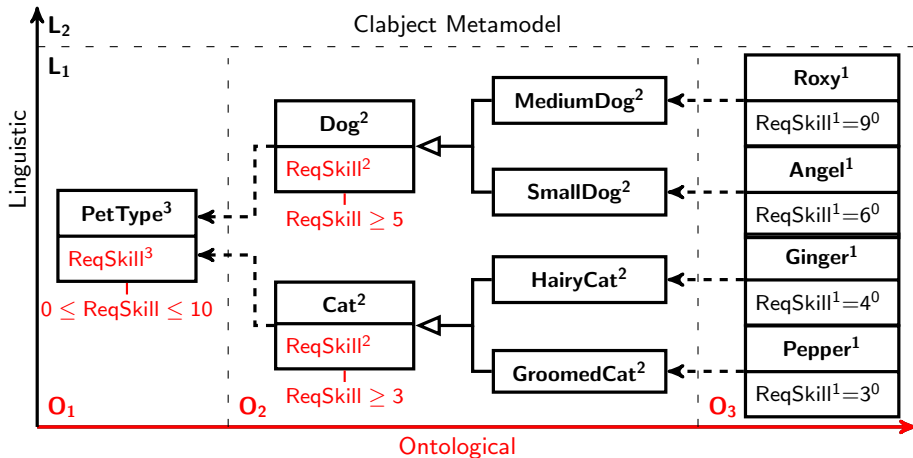
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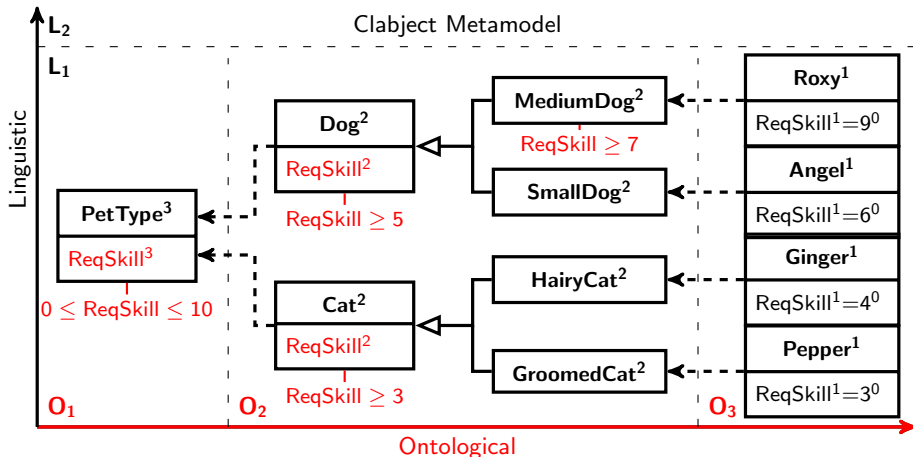


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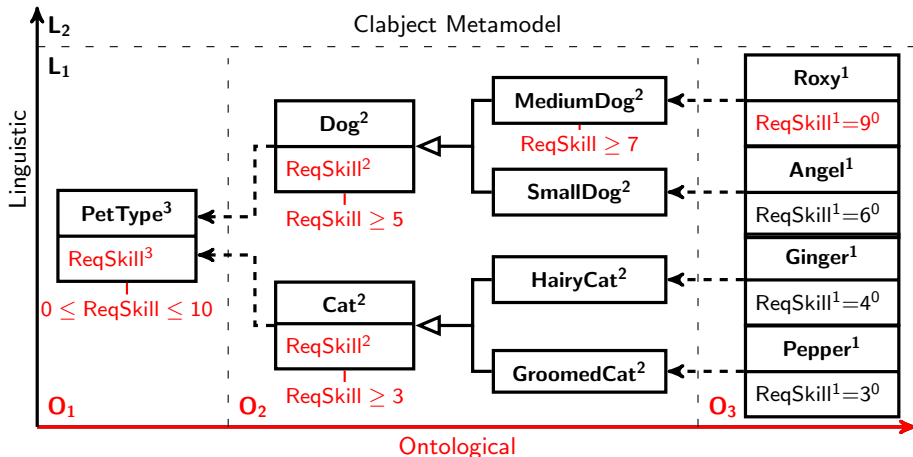




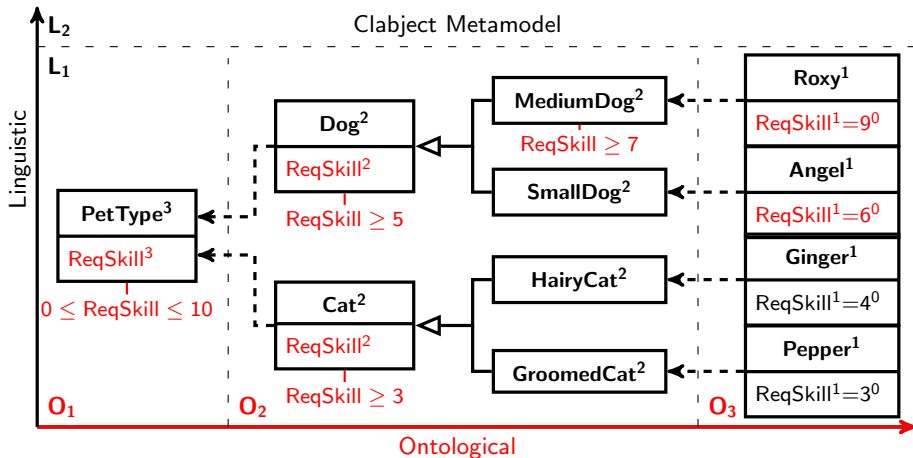
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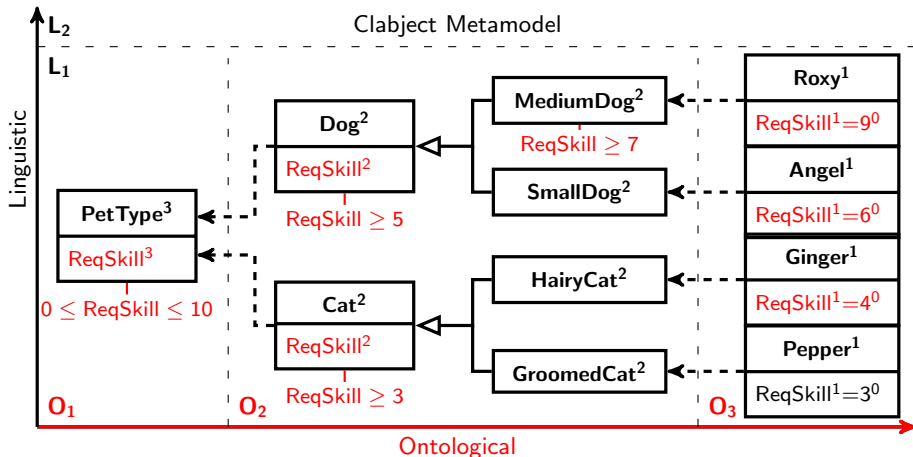
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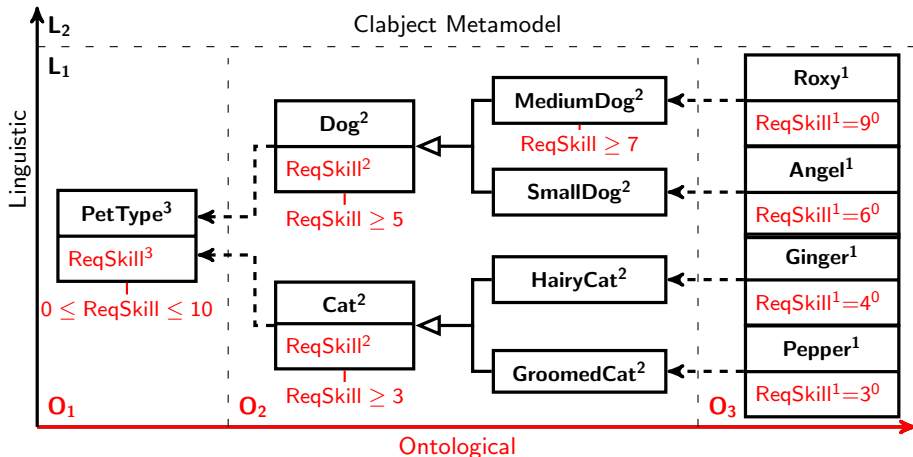
# Dimensions of Consistency



# Dimensions of Consistency



# Dimensions of Consistency



## Dimensions of Consistency (cont.)

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- Linguistic conformance
  - Paradigm-specific rules
- Ontological conformance
  - Domain-specific rules
  - Paradigm-specific rule application
    - e.g., instantiation, inheritance
- Issue: consistency checkers for either linguistic or ontological conformance



## Paradigm-agnostic Approach – Goals

- Unified checking of paradigm-specific and domain-specific rules
- Efficient handling of evolution



## Paradigm-agnostic Approach – Solution

- Reduce consistency checking to single dimension
- $\Rightarrow$  check only ontological level

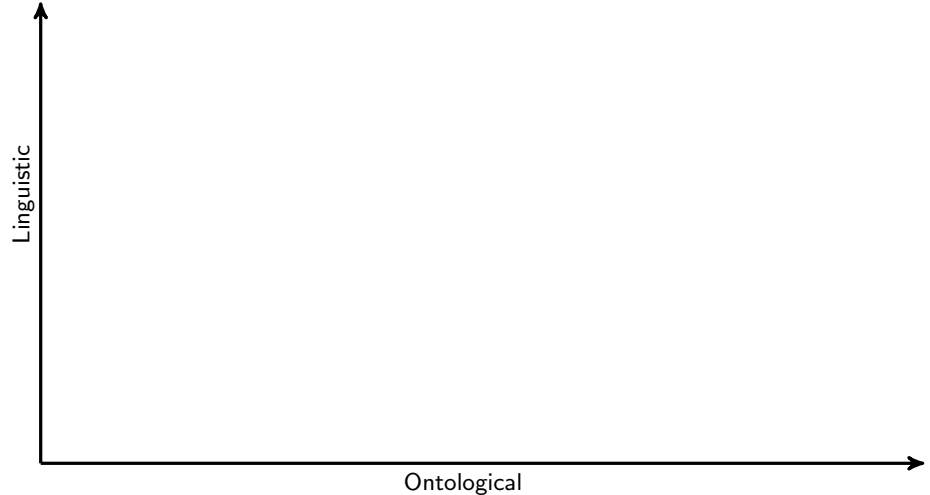




# Paradigm-agnostic Approach – Solution Illustration

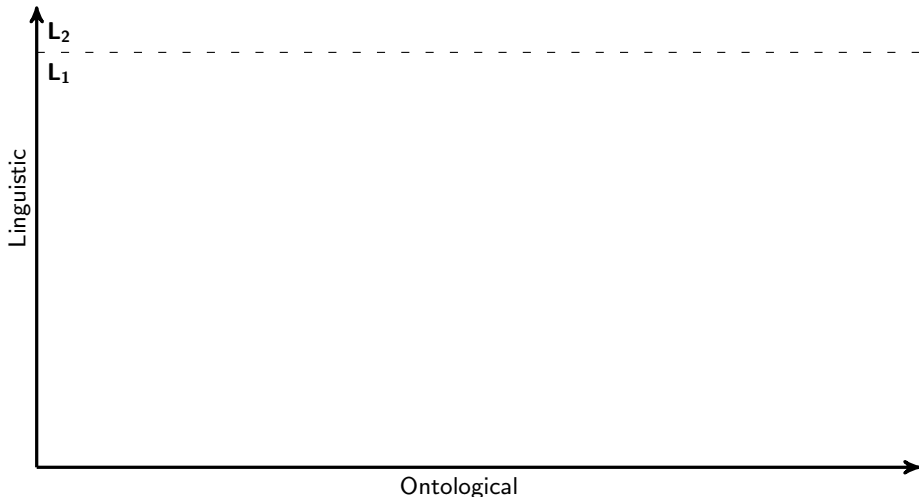


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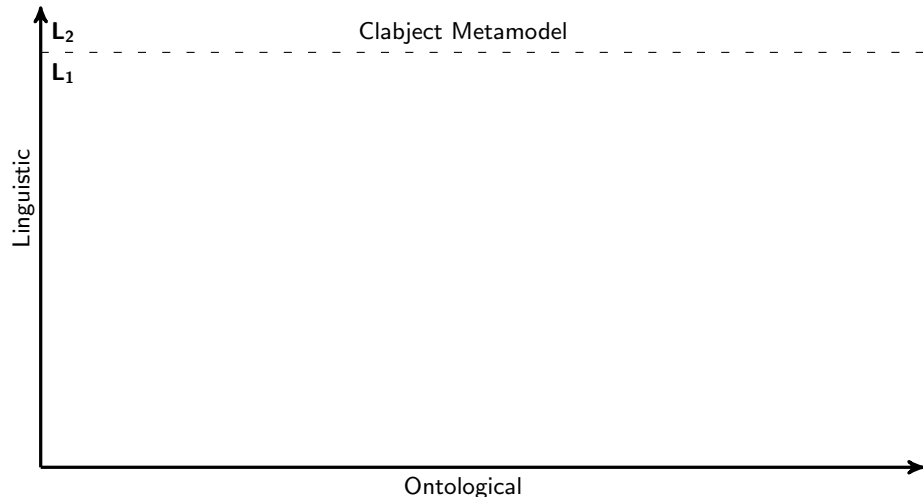


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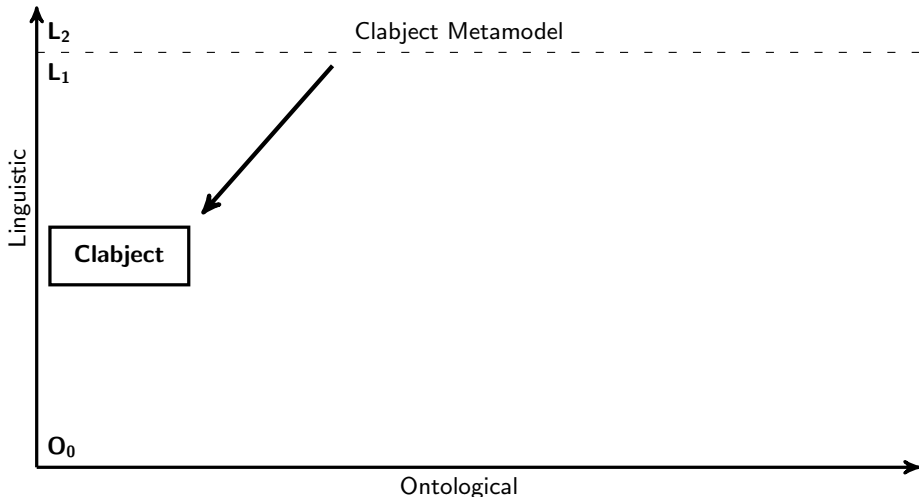




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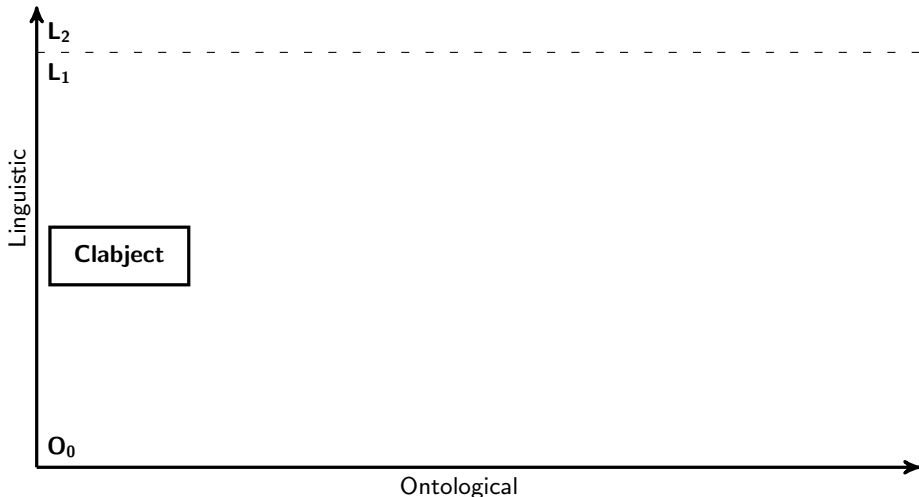


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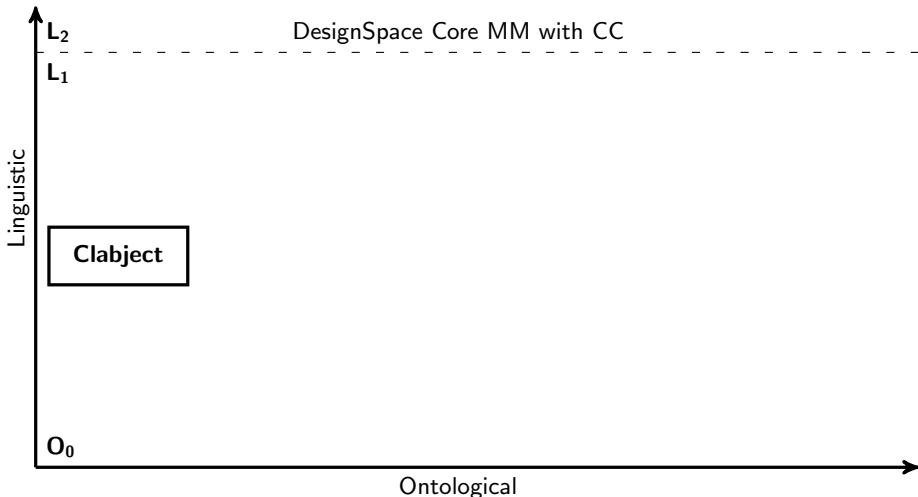


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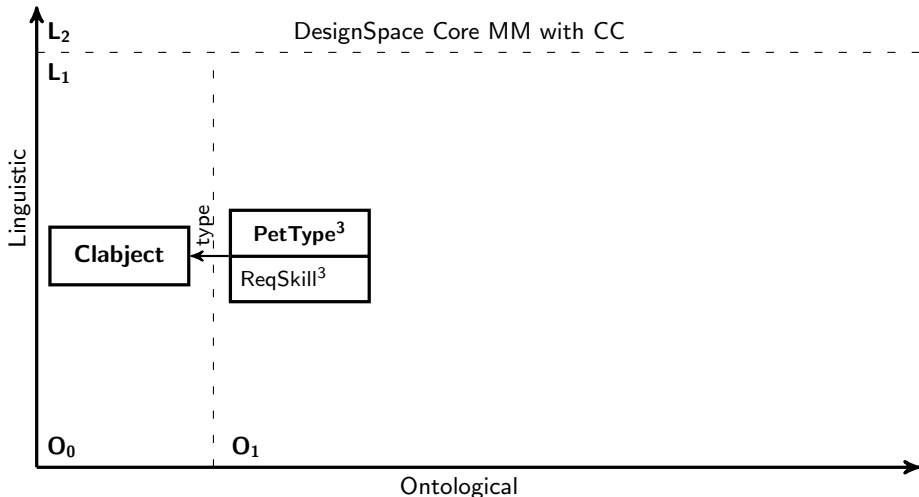




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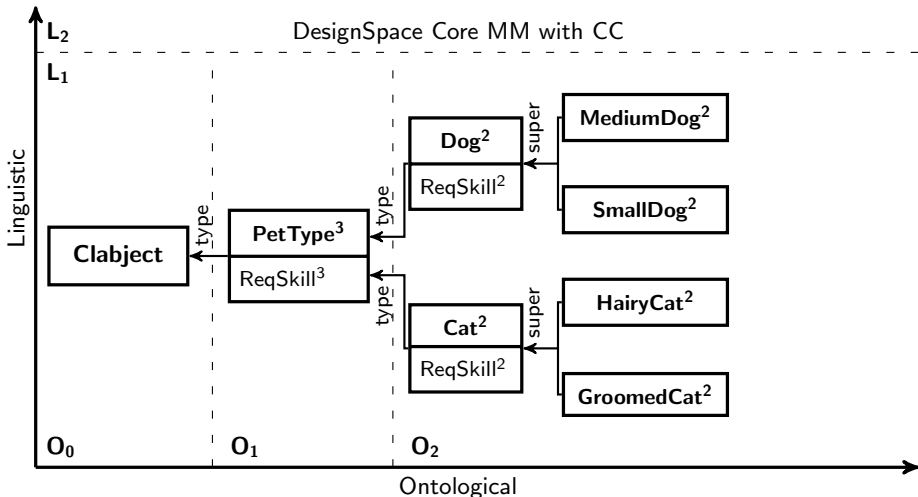


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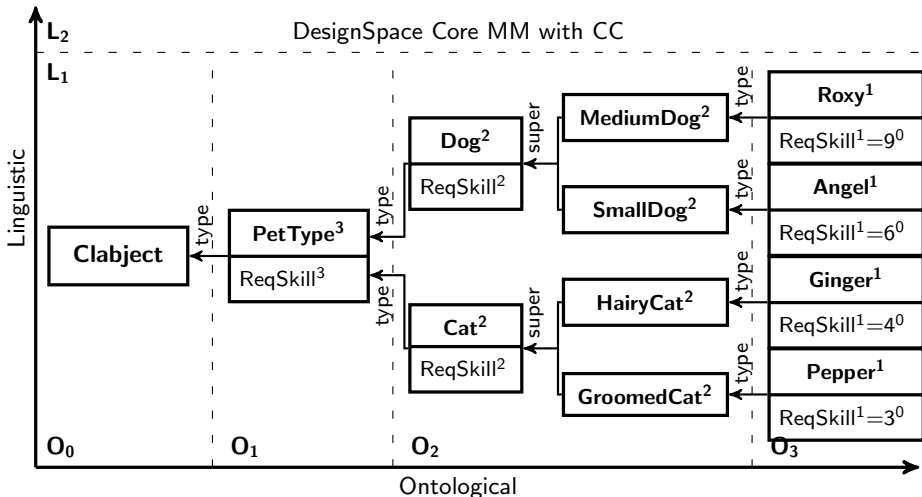


## Paradigm-agnostic Approach – Solution Illustration



# Paradigm-agnostic Approach – Solution Illustration

DesignSpace Core MM with CC



## Paradigm-agnostic Approach – Summary

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- Unified checking of consistency for arbitrary paradigms
- Rule application strategies
  - Ranges for checked levels
  - Dynamic interpretation of level-specific modeling semantics
- Efficient evolution handling
  - Model/Analyzer approach
  - Incremental checking after atomic changes



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Der Wissenschaftsfonds.



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# Paradigm-agnostic Approach – DS Core MM w/ CC

