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Towards Semantic Interoperability in WoT Ecosystems

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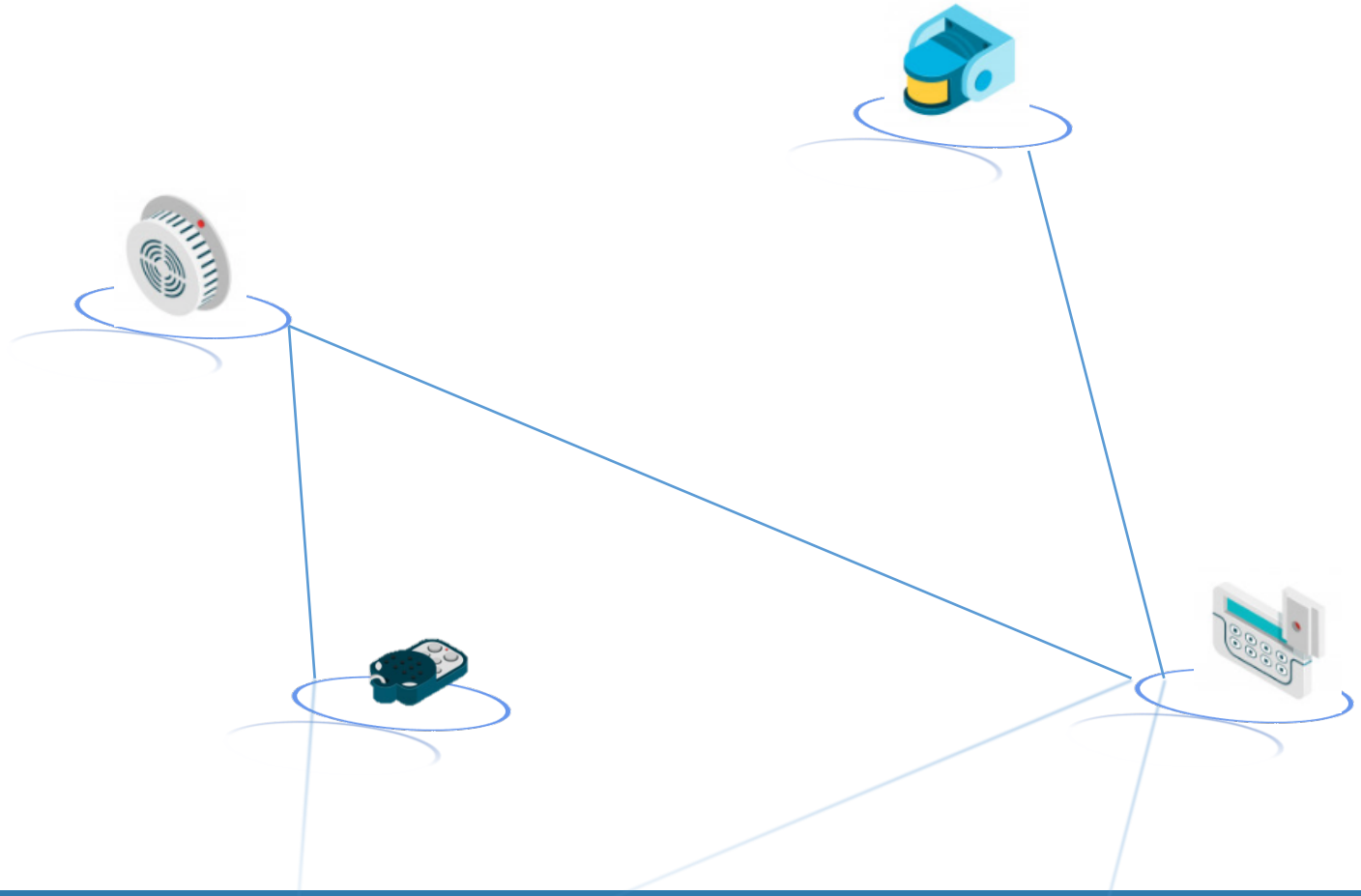
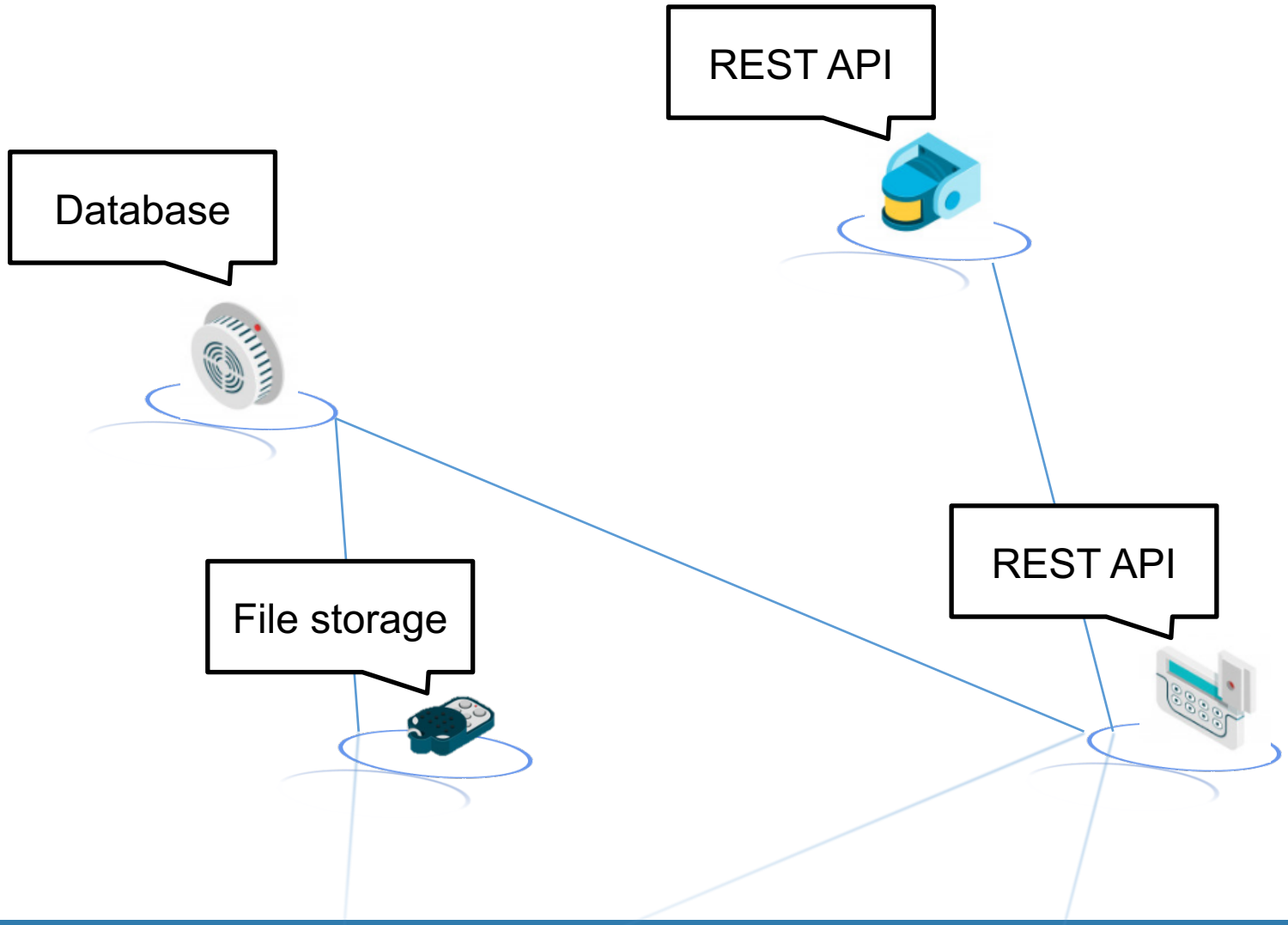
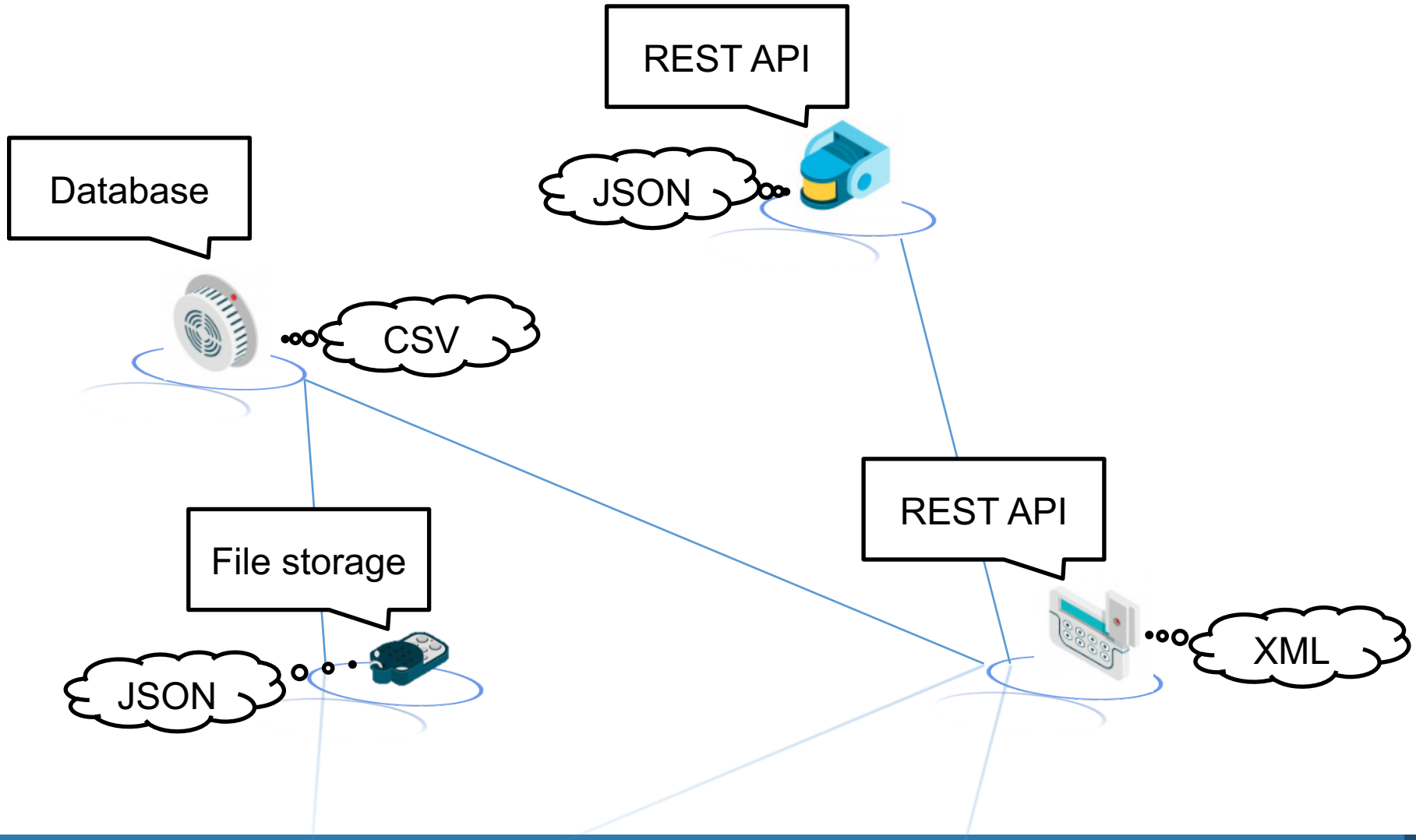
The Web of …



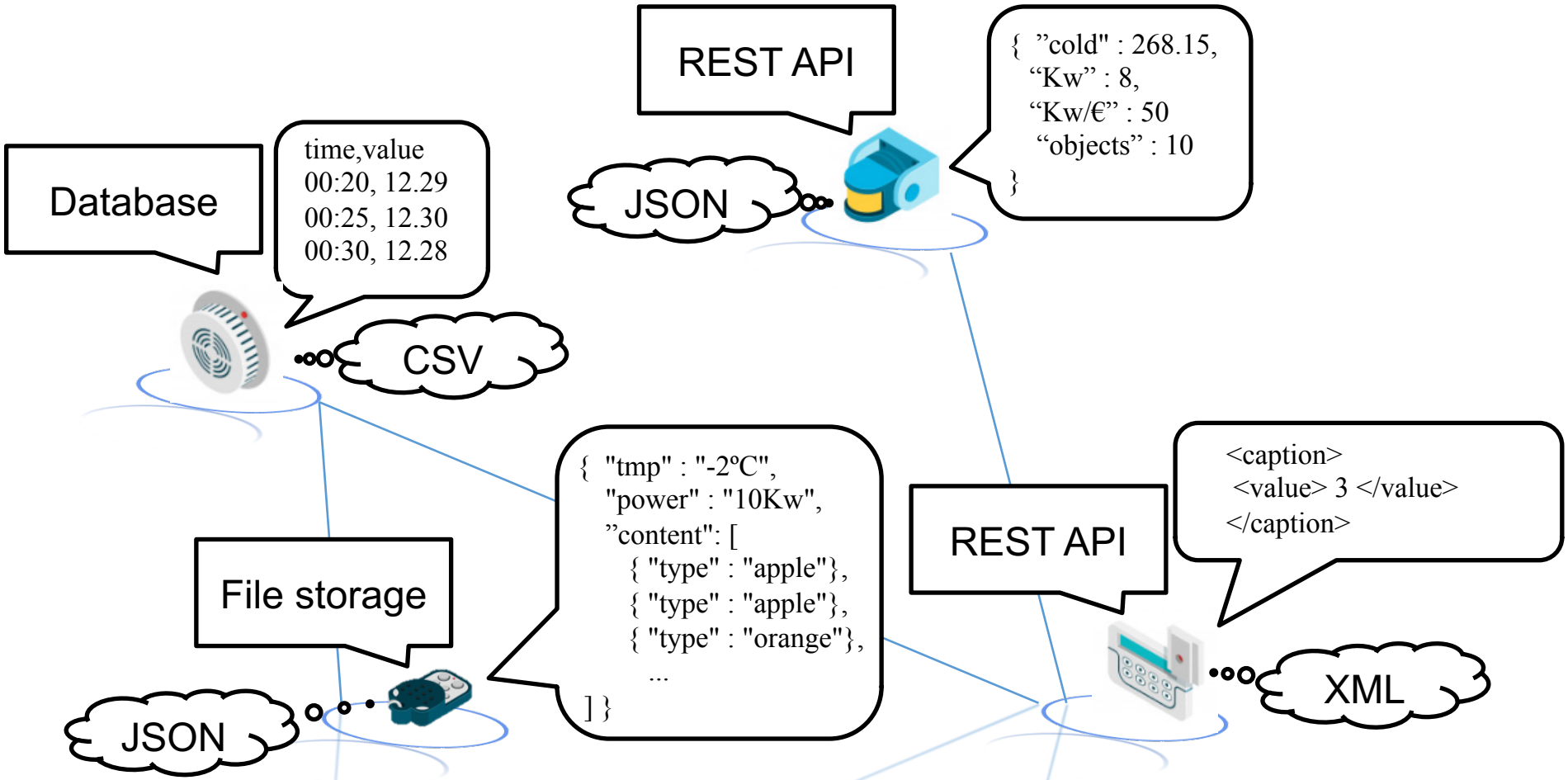
Heterogeneus Access



Heterogeneus Access **Heterogeneus Formats**



Heterogeneus Access | Heterogeneus Formats | **Heterogeneus Models**



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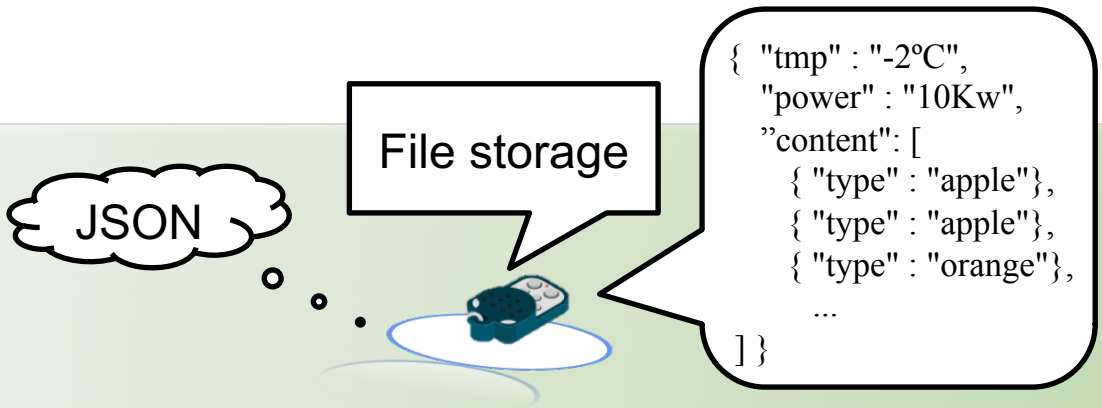
Bringing Semantic Interoperability

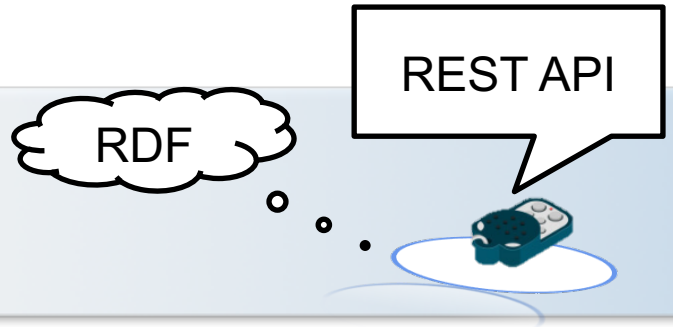
Heterogeneity:

- Heterogeneus Access
- Heterogeneus Formats
- Heterogeneus Models

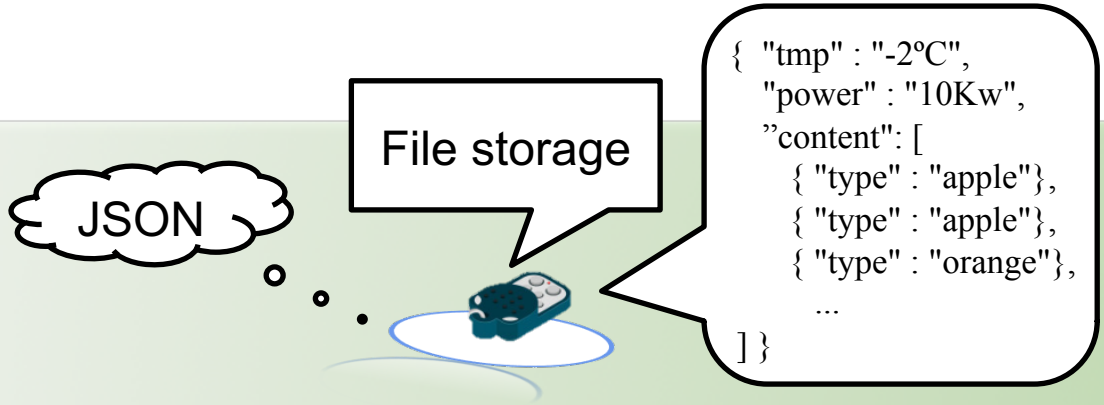


Bringing Semantic Interoperability

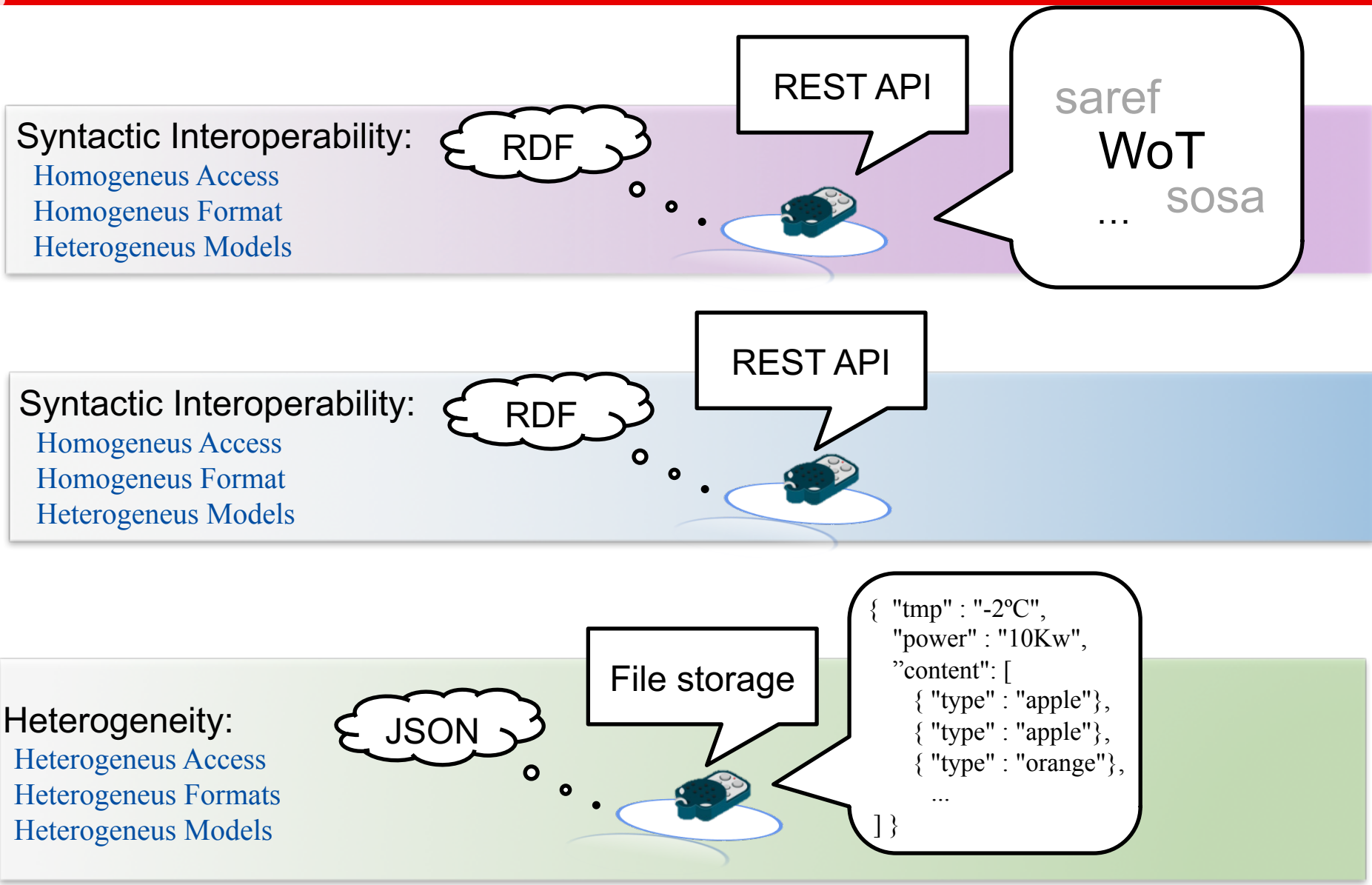
Syntactic Interoperability:
- Homogeneus Access
- Homogeneus Format
- Heterogeneus Models



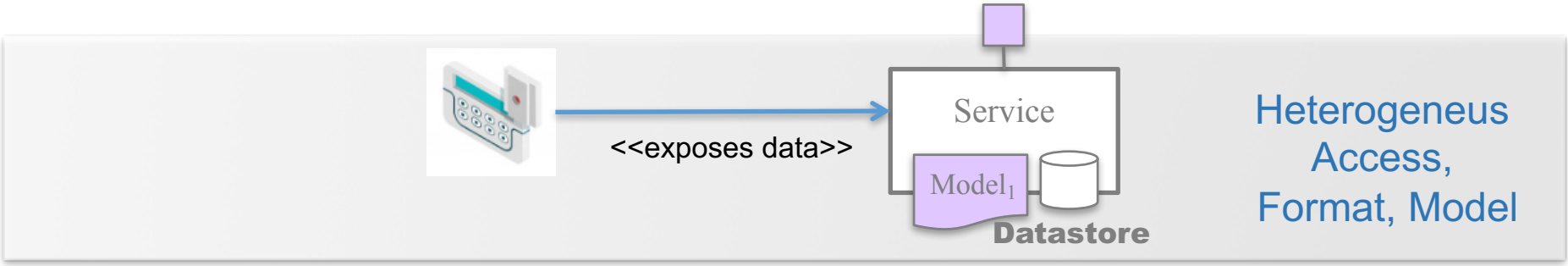
Heterogeneity:
- Heterogeneus Access
- Heterogeneus Formats
- Heterogeneus Models



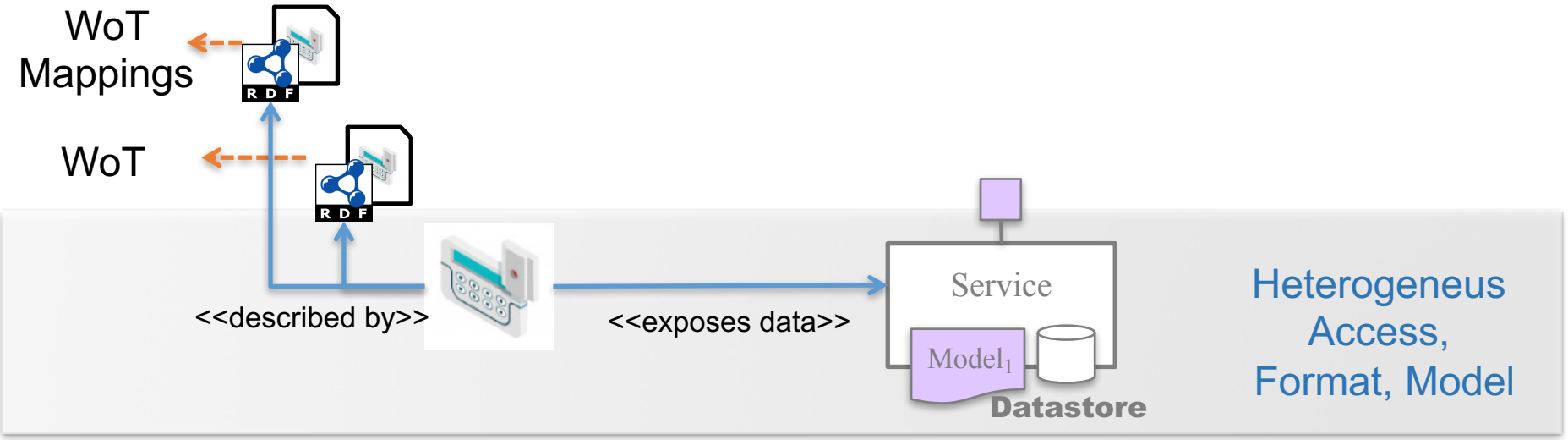
Bringing Semantic Interoperability



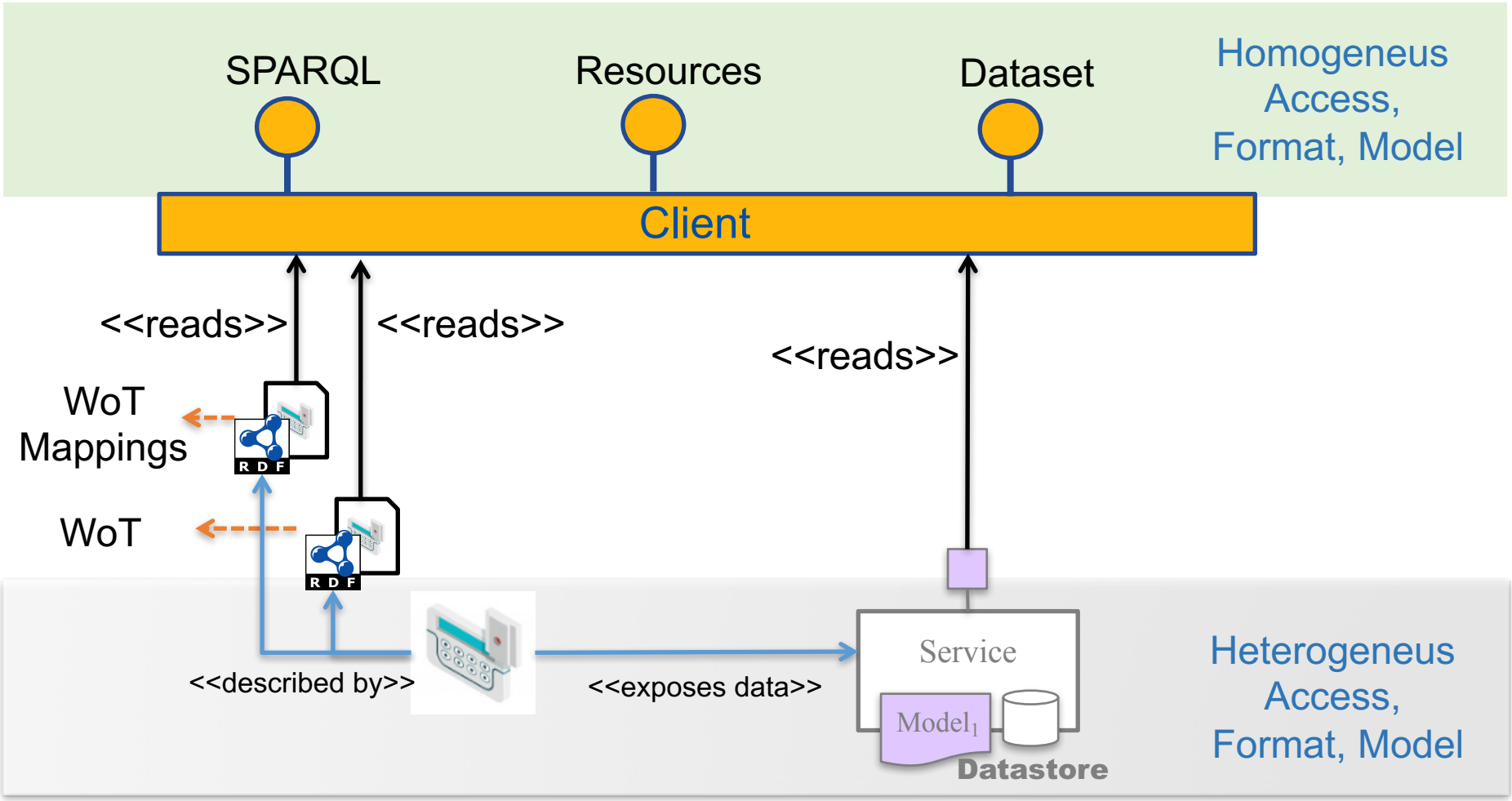
Overcoming heterogeneity



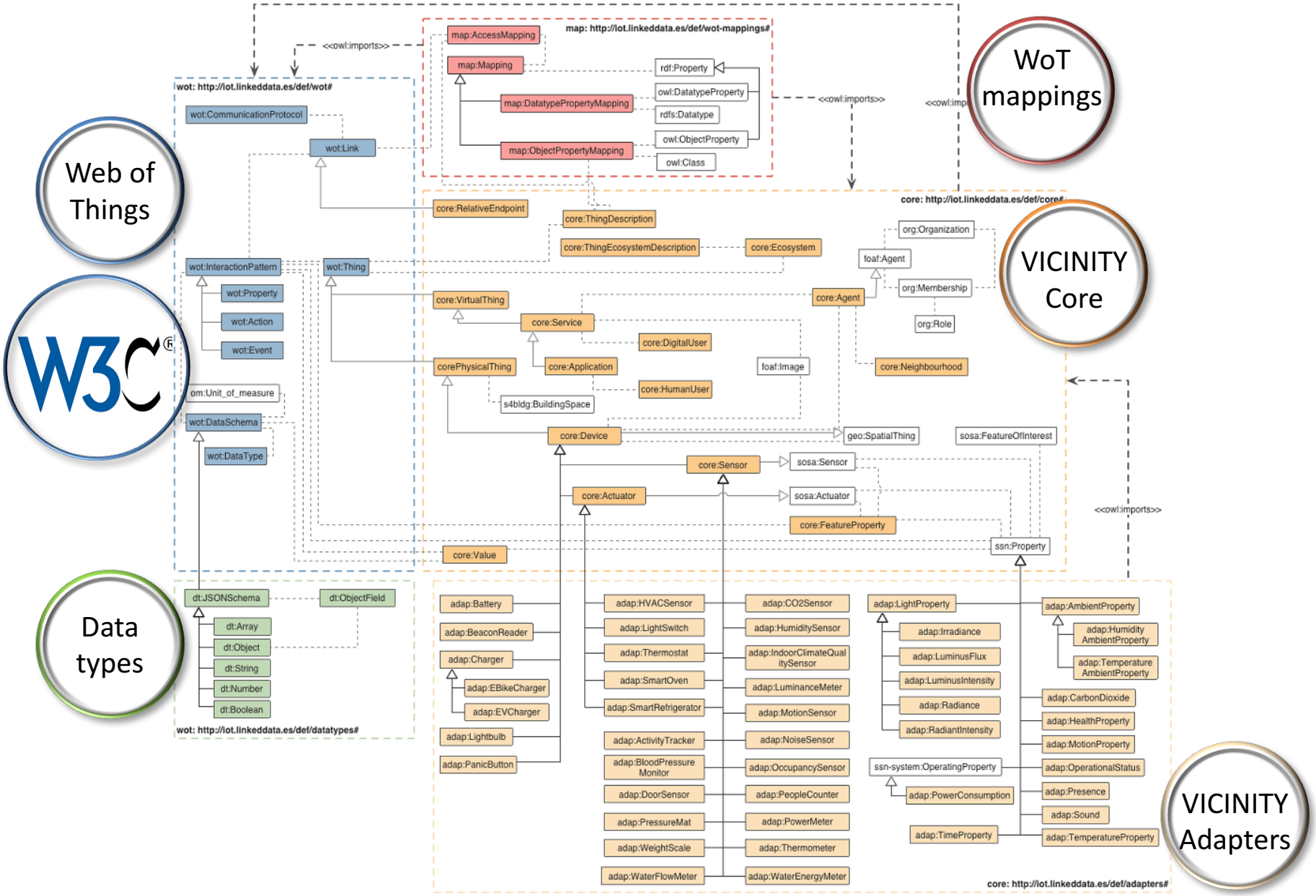
Overcoming heterogeneity

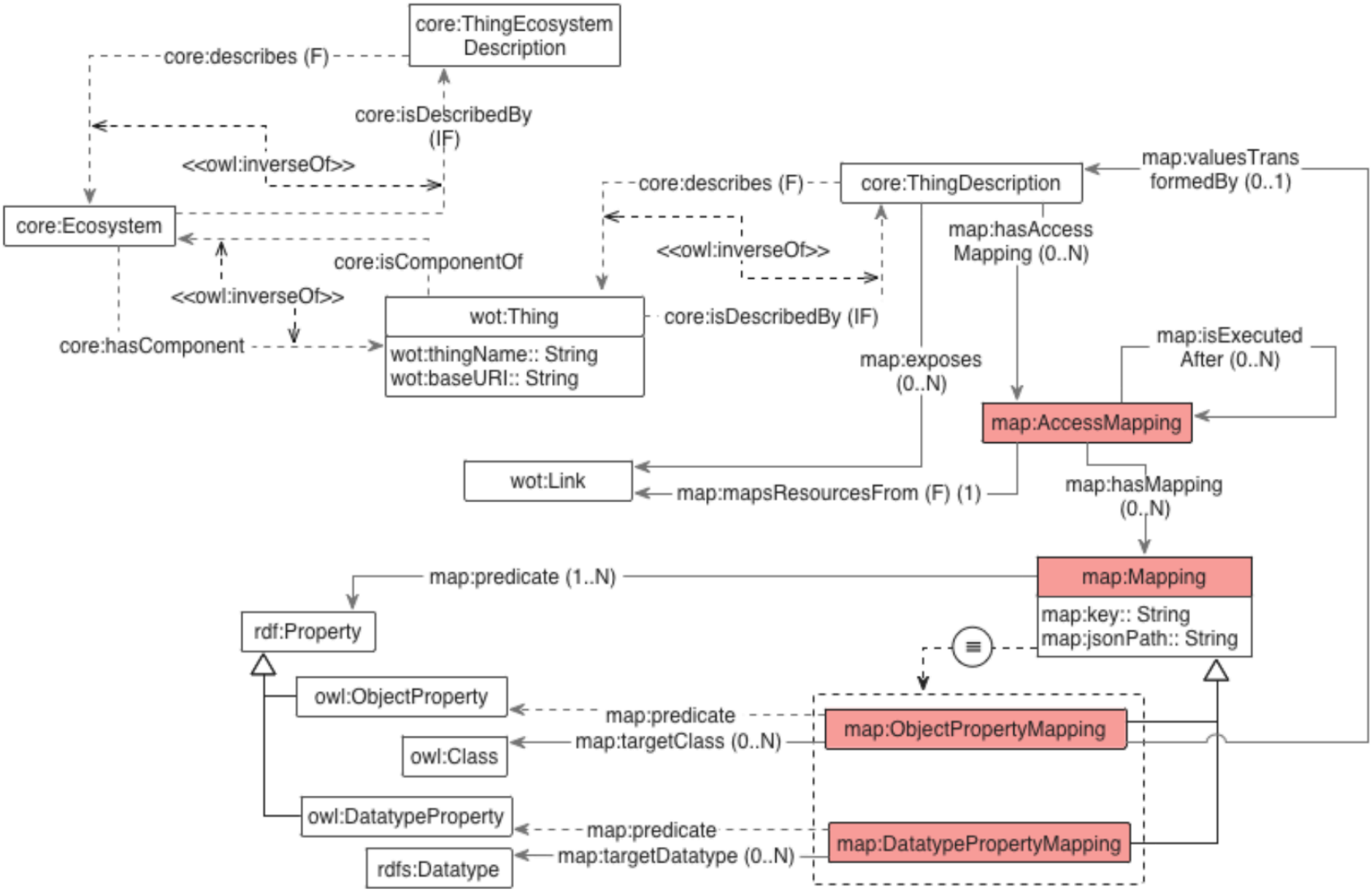


Overcoming heterogeneity



Ontology overview

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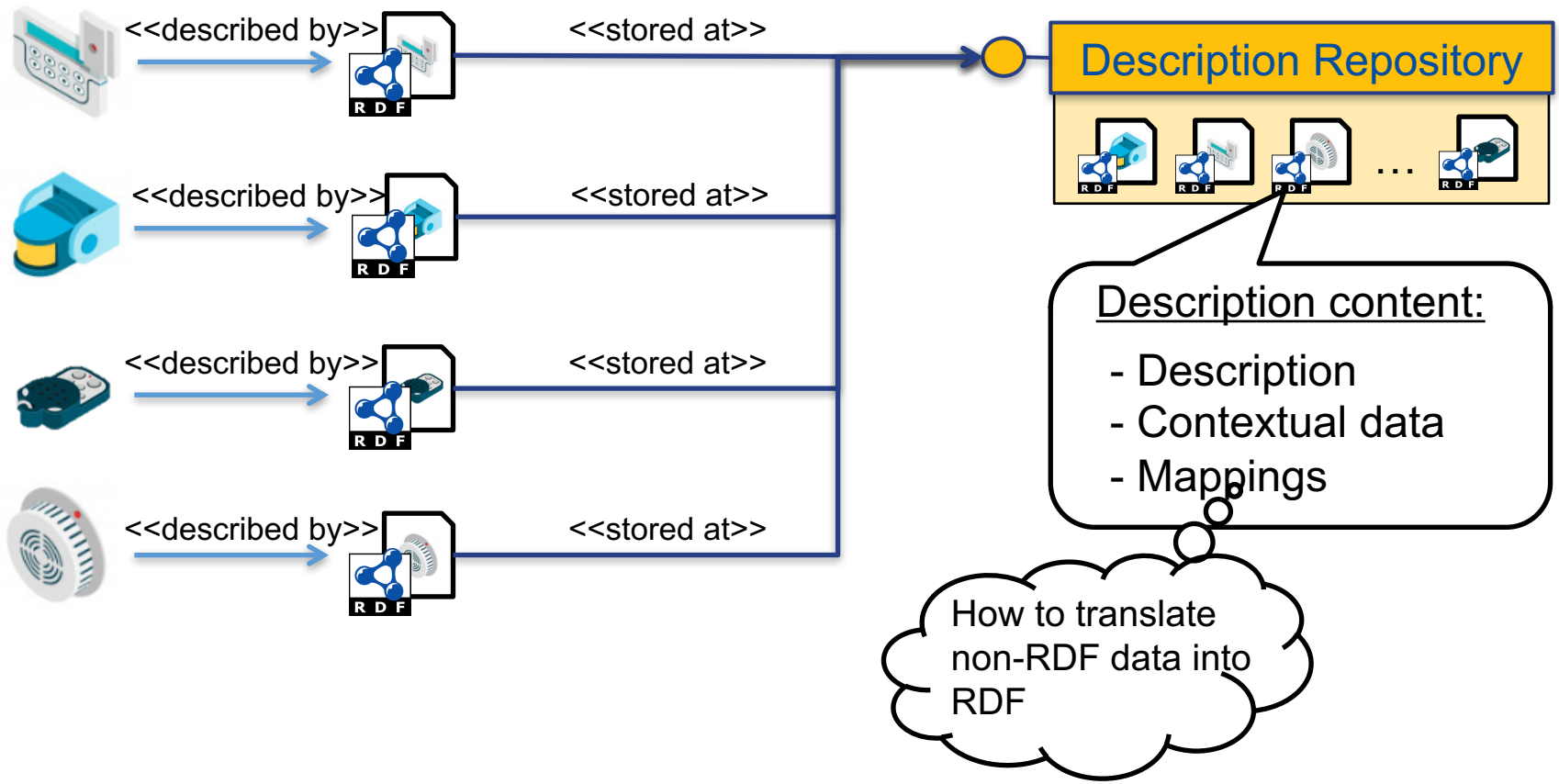
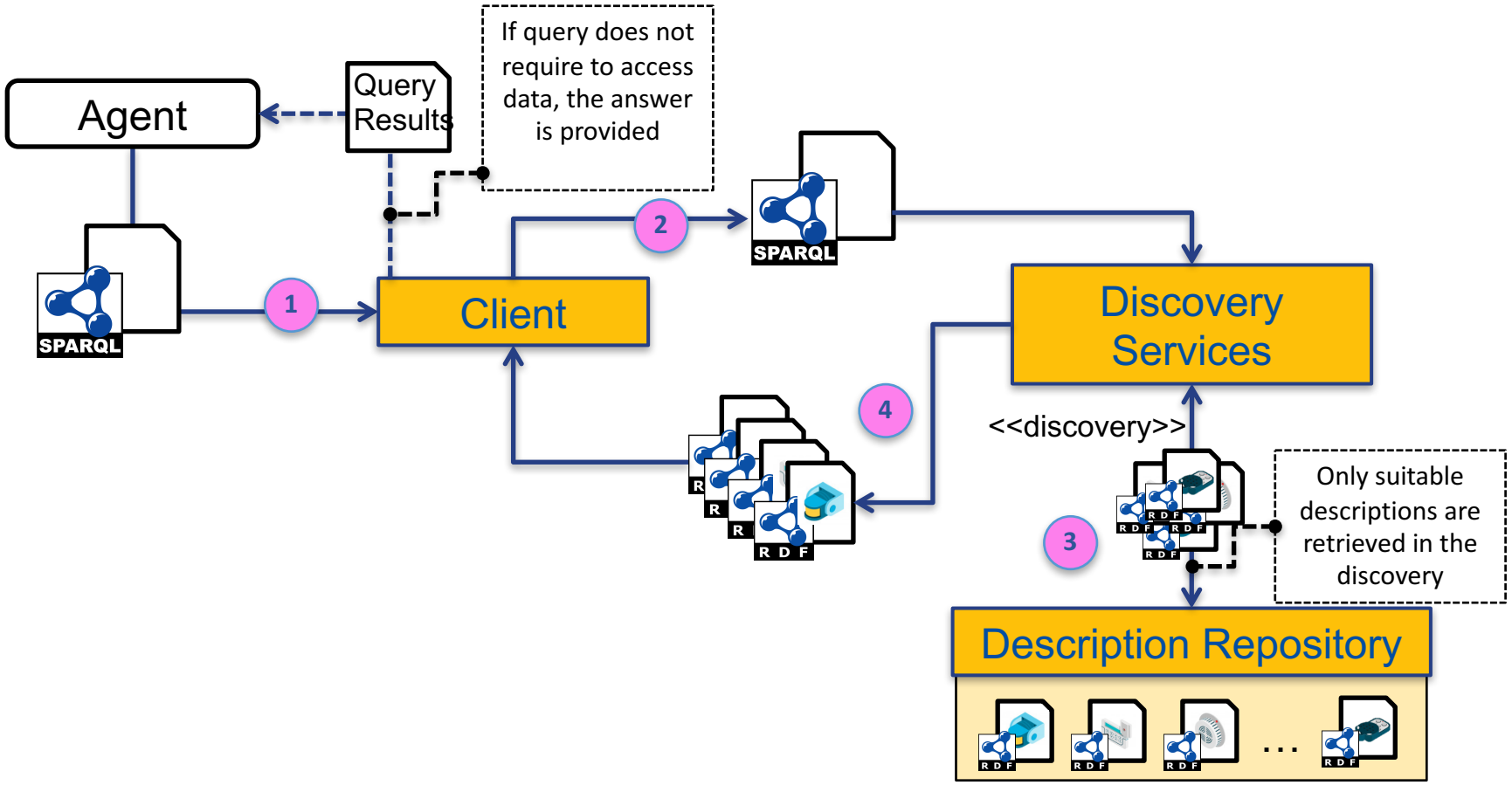
core:describes (F)
core:isDescribedBy (IF)
<<owl:inverseOf>>
core:Ecosystem
core:isComponentOf
<<owl:inverseOf>>
core:hasComponent
wot:Thing
wot:thingName:: String
wot:baseURI:: String
core:describes (F)
core:ThingDescription
<<owl:inverseOf>>
core:isDescribedBy (IF)
map:valuesTransformedBy (0..1)
map:hasAccessMapping (0..N)
map:exposes (0..N)
map:isExecutedAfter (0..N)
map:AccessMapping
wot:Link
map:mapsResourcesFrom (F) (1)
map:hasMapping (0..N)
map:Mapping
map:key:: String
map:jsonPath:: String
map:predicate (1..N)
rdf:Property
owl:ObjectProperty
owl:Class
owl:DatatypeProperty
rdfs:Datatype
map:predicate
map:targetClass (0..N)
map:predicate
map:targetDatatype (0..N)
map:ObjectPropertyMapping
map:DatatypePropertyMapping

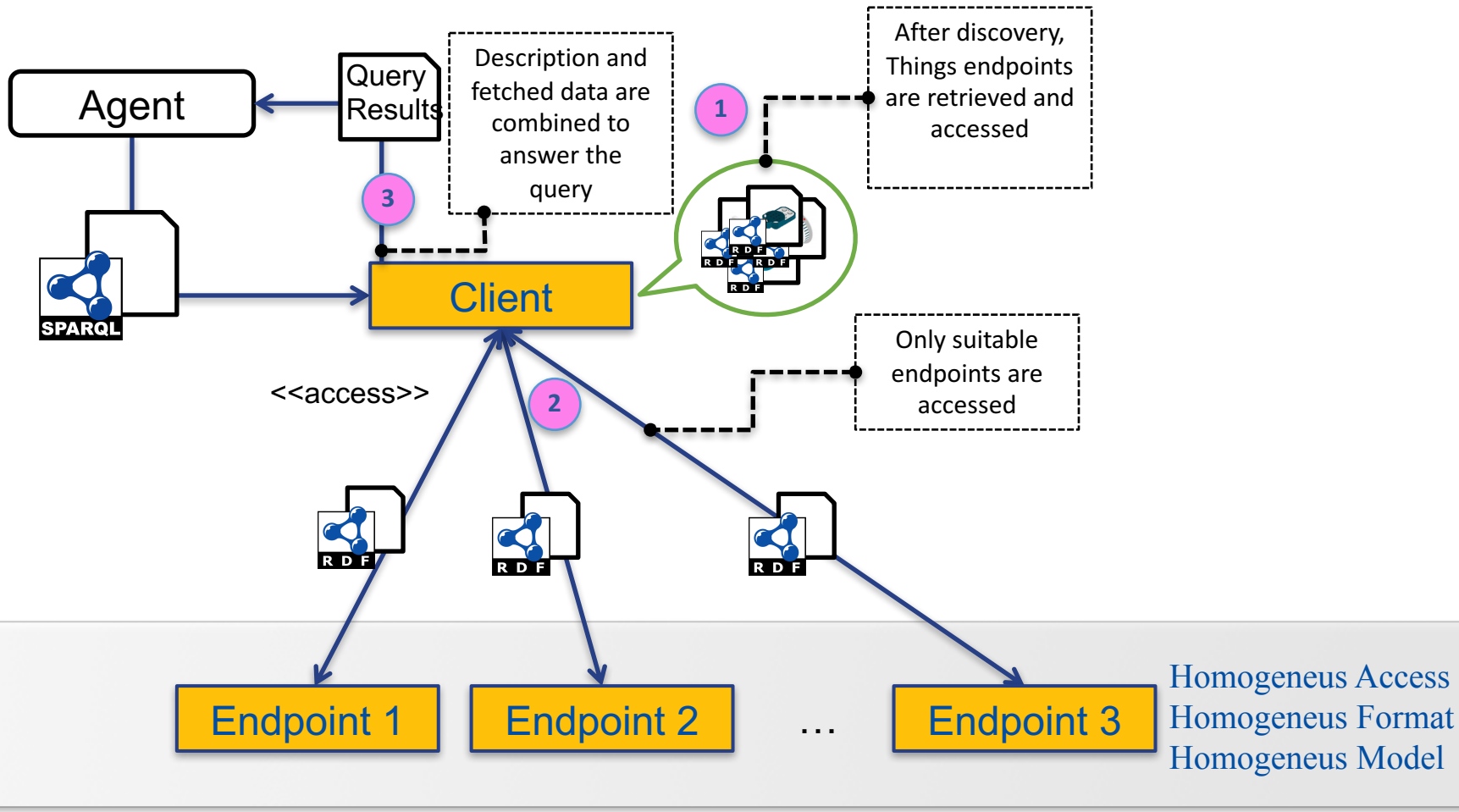
Semantic Interoperability Services: Registering “Things”



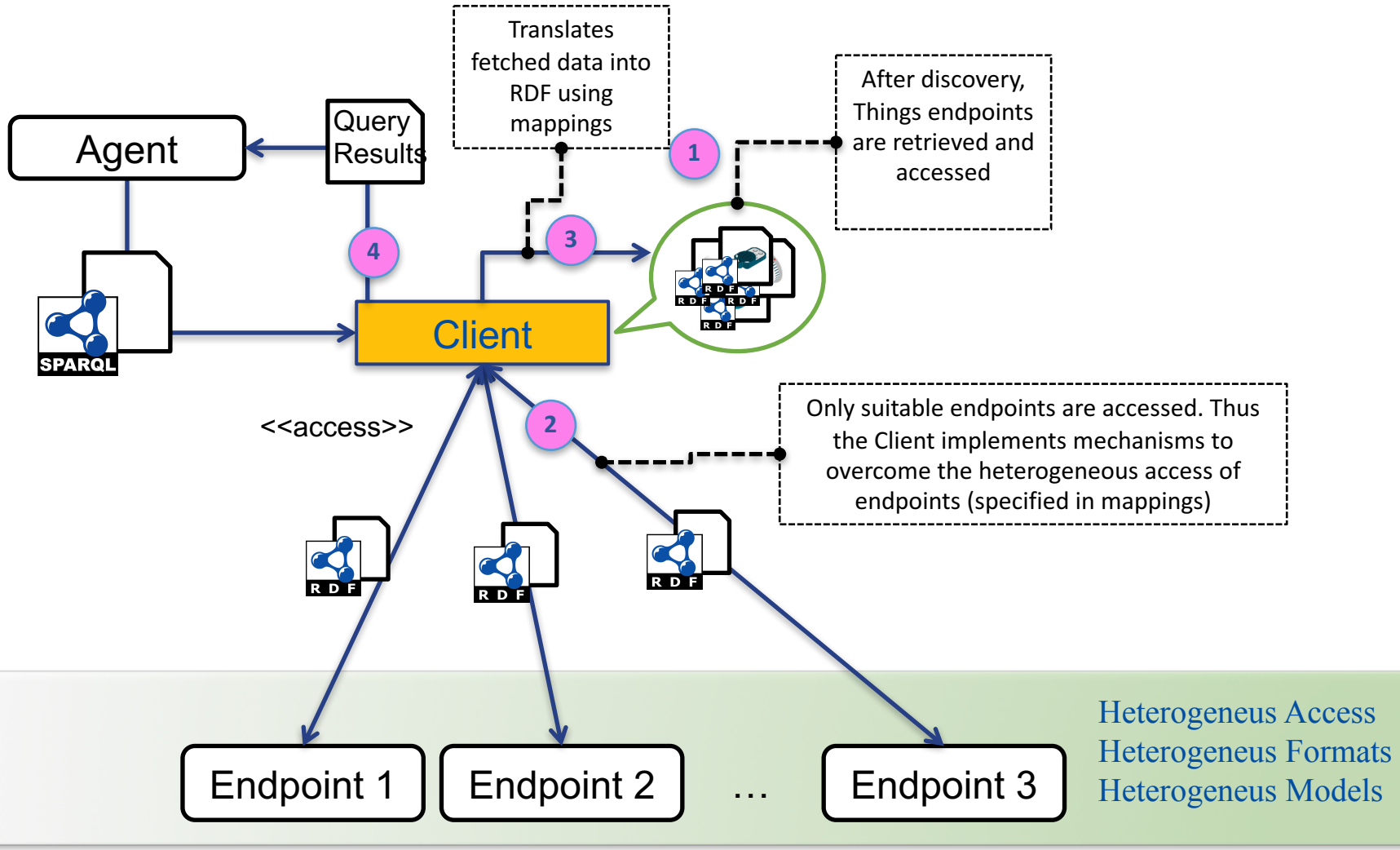
Semantic Interoperability Services: Discovery “Things”



Semantic Interoperability Services: Distributed access to “Things”



Semantic Interoperability Services: Distributed access to “Things”



WoT in our research

Projects:

VICINITY 2020

DELTA

Specifications:

WoT-Mappings

Impementations:

WoT-Implementation

Helio
(mapping processor)

Conclusions of our approach

- Allows to **transparently discover Things relaying on their descriptions**
- Performs a **distributed access**, if required, **only to the suitable endpoints** to answer a query
- Provides a transparent mechanism to interact with heterogeneous environments of data
  - Mapping-based normalisation of access points, format, model
- **May follow any of the privacy policies required**
- Supports **centralised or decentralised architectures**
- **Based on WoT + WoT-mappings ontology**
  - Plus other ancillary ontologies like core, adapters, saref, …

Achieving interoperability is not only about descriptions, but also about providing mechanisms for automatic data discovery and access from heterogeneous data sources