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# SLOVAK SEMANTIC INTEROPERABILITY FRAMEWORK 2021

**ENDORSE.**  
THE EUROPEAN DATA CONFERENCE ON REFERENCE DATA AND SEMANTICS



# Agenda

1. Semantic Interoperability in Slovakia 2016 – 2020
2. Actual Challenges
3. 2021 Objectives
4. 2022+

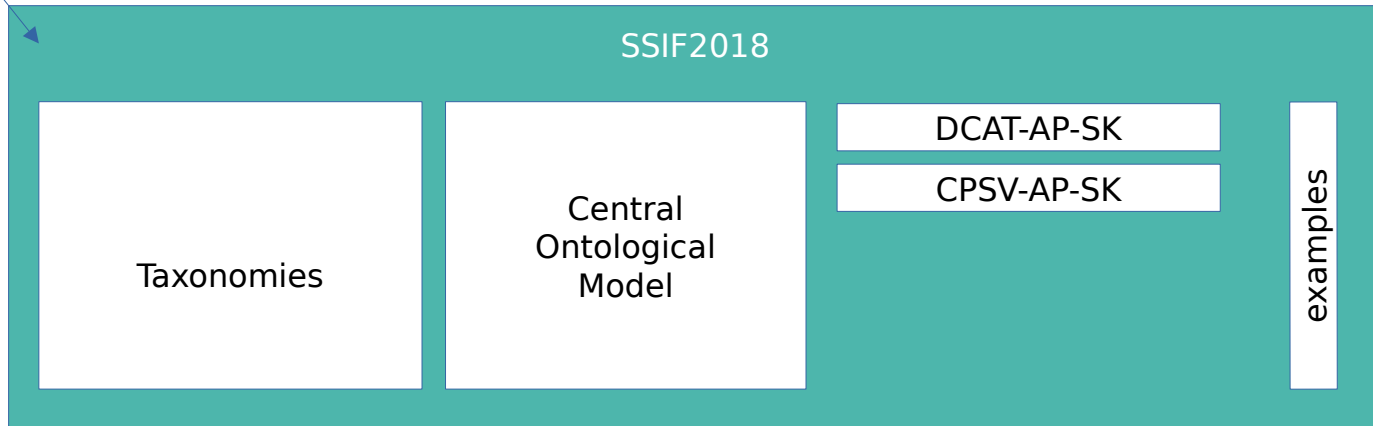


# Part I.

## Semantic Interoperability in Slovakia 2016 – 2020




## Semantic Interoperability in Slovakia 2016 - 2020





# MetaIS

## Central Ontological Model Of Base Registries



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### Centrálny model údajov verejnej správy 1.1

Prehľad ontológií a ich distribúcií (2018-03-26)

Ontológia fyzickej osoby	<a href="#">RDF/XML</a>	<a href="#">UML/PNG</a>	<a href="#">HTML</a>	<a href="#">PDF</a>
Ontológia právneho subjektu	<a href="#">RDF/XML</a>	<a href="#">UML/PNG</a>	<a href="#">HTML</a>	<a href="#">PDF</a>
Ontológia finančných entít	<a href="#">RDF/XML</a>	<a href="#">UML/PNG</a>	<a href="#">HTML</a>	<a href="#">PDF</a>
Ontológia lokácie	<a href="#">RDF/XML</a>	<a href="#">UML/PNG</a>	<a href="#">HTML</a>	<a href="#">PDF</a>
Ontológia egovernment entít	<a href="#">RDF/XML</a>	<a href="#">UML/PNG</a>	<a href="#">HTML</a>	<a href="#">PDF</a>



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- STANDARDIZATION AND DATA OBJECTS**
  - Standardization process >
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  - Reference registers >
  - Codelist >
  - Reference identifiers **>**
    - List of request
    - List of accepted URI
    - Catalog of dataitems

[Main page](#) > [Standardization and data objects](#) > [Reference identifiers](#) > URI - zoznam

### List of reference identifiers (URI)

Show advanced options of records filter

Use module for standard drafts to add request

View  records

Name ↕	URI	Type	Status
Číselník typ adresy	<a href="https://data.gov.sk/set/codelist/CL010139">https://data.gov.sk/set/codelist/CL010139</a>	Dataset	Registration accepted
Číselník agendy verejnej správy	<a href="https://data.gov.sk/set/codelist/CL000645">https://data.gov.sk/set/codelist/CL000645</a>	Dataset	Registration accepted
Číselník úseky verejnej správy	<a href="https://data.gov.sk/set/codelist/CL000644">https://data.gov.sk/set/codelist/CL000644</a>	Dataset	Registration accepted
Identifikátor adresy	<a href="https://data.gov.sk/id/physical-address/[id]">https://data.gov.sk/id/physical-address/[id]</a>	URI template	Registration accepted
Číselník životné situácie	<a href="https://data.gov.sk/set/codelist/CL000646">https://data.gov.sk/set/codelist/CL000646</a>	Dataset	Registration accepted
URI konkrétnej lokálnej štatistickej jednotky úrovne 1 (okres)	<a href="https://data.gov.sk/id/lau1/[ID]">https://data.gov.sk/id/lau1/[ID]</a>	URI template	Registration accepted
URI konkrétnej lokálnej štatistickej jednotky (okres)	<a href="https://data.gov.sk/id/lau2/[ID]">https://data.gov.sk/id/lau2/[ID]</a>	URI template	Registration accepted
URI konkrétnej regionálnej štatistickej jednotky (kraj)	<a href="https://data.gov.sk/id/nuts3/[ID]">https://data.gov.sk/id/nuts3/[ID]</a>	URI template	Registration accepted
URI definície typu okruhu životnej situácie	<a href="https://data.gov.sk/def/egov/life-situation-scope/[ID]">https://data.gov.sk/def/egov/life-situation-scope/[ID]</a>	URI template	Registration accepted
URI konkrétneho egov kontraktu	<a href="https://data.gov.sk/id/egov/contract/[ID]">https://data.gov.sk/id/egov/contract/[ID]</a>	URI template	Registration accepted



# Part II.

Actual  
Challenges



## Problems in semantic interoperability (SK2020) 1/2

- Semantic interoperability standards were established relatively recently. Penetration of defined ontologies, taxonomies goes to slowly toward public information systems.
- Still, most of the same public data is represented in different structures with different identifiers.
- Low expressiveness of reference data (codelists instead of rich taxonomies, lack in using ontologies, rules, knowledge graphs).



## Problems in semantic interoperability (SK2020) 2/2



- Central Metainformation system doesn't contain RDF triplestore. The published semantic infrastructure is only available for download. MetaIS is not able to provide dereferencing toward RDF resources in MetaIS.
- Until today, semantic standards were developed by external activists with their semantic tools. In Data Office, we miss such software tools.
- National integration project (Talend based) that provides infrastructure for Once and only principle in Slovakia (centralized approach), is not aligned with semantic interoperability standards.

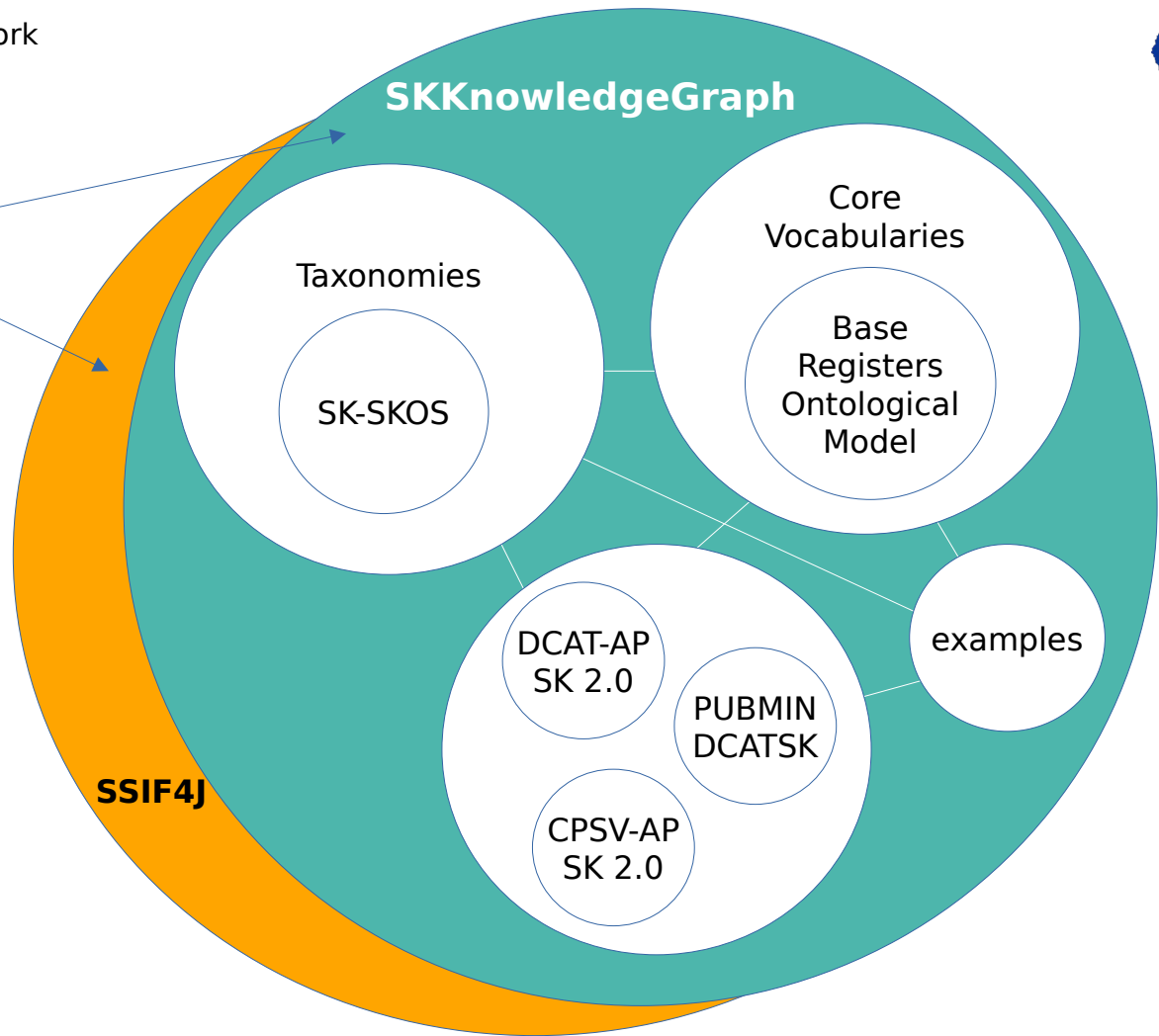


# Part III.

## 2021 Objectives



# SK GOV KnowledgeGraph





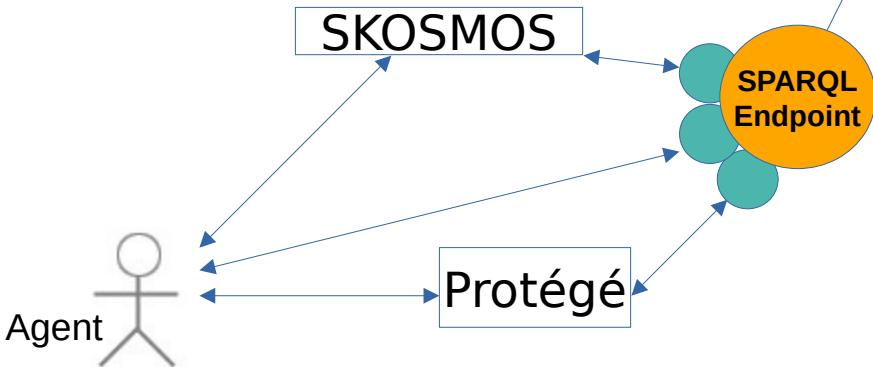
1. Deploy **SKKnowledgeGraph** to triplestore and provide data services

Plan 2021



SSIF uses **opensource**

- SKOSMOS** (taxonomies)
- Protégé (ontologies)
- SSIF4J** (open source java project – public data to RDF)
- RDF4J** API + Server  
Eclipse, SpringBoot





## Plan 2021

# 2. Represent national ontologies of Base Registers in more formats

### Centrálny model údajov verejnej správy 1.2

	★★★★★			★★★				★			
Ontológia fyzickej osoby	RDF/TTL	<a href="#">RDF/XML</a>	JSON-LD	<a href="#">UML/XMI</a>	ArchiMate	XSD (1)	<a href="#">XSD (*)</a>	ODT	PDF	RDF/PNG	UML/PNG
Ontológia právneho subjektu	RDF/TTL	RDF/XML	JSON-LD	UML/XMI	ArchiMate	XSD (1)	<a href="#">XSD (*)</a>	ODT	PDF	RDF/PNG	UML/PNG
Ontológia finančných entít	RDF/TTL	RDF/XML	JSON-LD	UML/XMI	ArchiMate	XSD (1)	<a href="#">XSD (*)</a>	ODT	PDF	RDF/PNG	UML/PNG
Ontológia lokácie	RDF/TTL	<a href="#">RDF/XML</a>	JSON-LD	UML/XMI	ArchiMate	XSD (1)	<a href="#">XSD (*)</a>	ODT	PDF	RDF/PNG	UML/PNG
Ontológia e-government entít	<a href="#">RDF/TTL</a>	<a href="#">RDF/XML</a>	JSON-LD	UML/XMI	ArchiMate	XSD (1)	<a href="#">XSD (*)</a>	ODT	PDF	RDF/PNG	<a href="#">UML/PNG</a>



# Plan 2021

## 2. Represent central model of public data in more formats

### Person.XSD

```

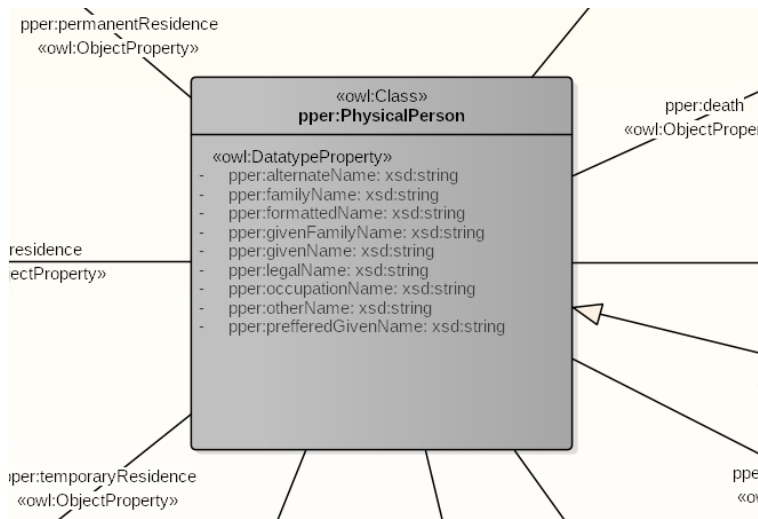
<xsd:import namespace="http://www.w3.org/ns/adms#" schemaLocation="adms.xsd"/>
<xsd:import namespace="https://data.gov.sk/def/ontology/location/" schemaLocation="location.xsd"/>
<xsd:import namespace="http://purl.org/dc/terms/" schemaLocation="dct.xsd"/>
<xsd:import namespace="http://www.w3.org/2004/02/skos/core#" schemaLocation="skos.xsd"/>

<xsd:element name="PhysicalPerson" type="pper:PhysicalPerson"/>
<xsd:complexType name="PhysicalPerson">
  <xsd:sequence>
    <xsd:element name="givenName" type="xsd:string" minOccurs="0"/>
    <xsd:element name="familyName" type="xsd:string" minOccurs="0"/>
    <xsd:element name="legalName" type="xsd:string" minOccurs="0"/>
    <xsd:element name="alternativeName" type="xsd:string" minOccurs="0"/>
    <xsd:element name="occupationName" type="xsd:string" minOccurs="0"/>
    <xsd:element name="givenFamilyName" type="xsd:string" minOccurs="0"/>
    <xsd:element name="birth" type="pper:birth" minOccurs="0"/>
    <xsd:element name="death" type="pper:death" minOccurs="0"/>
    <xsd:element name="maritalStatus" type="pper:maritalStatus" minOccurs="0"/>
    <xsd:element name="residence" type="pper:residence" minOccurs="0"/>
  </xsd:sequence>
</xsd:complexType>

<xsd:complexType name="birth">
  <xsd:sequence>
    <xsd:element name="Birth" type="pper:Birth"/>
  </xsd:sequence>
</xsd:complexType>

```

### Person.UML



```

<!-- https://data.gov.sk/def/ontology/physical-person/PhysicalPerson -->

```

```

<owl:Class rdf:about="#pper:PhysicalPerson">
  <rdfs:label xml:lang="en">Physical Person</rdfs:label>
  <rdfs:label xml:lang="sk">Fyzická osoba</rdfs:label>
  <rdfs:label xml:lang="de">natürliche Person</rdfs:label>
  <adms:identifier rdf:resource="https://data.gov.sk/id/identifier/metas-standard/538" />
  <rdfs:subClassOf rdf:resource="http://www.w3.org/ns/person/Person" />
  <rdfs:isDefinedBy rdf:resource="https://data.gov.sk/def/ontology/physical-person/2021-MM-DD.owl"/>
</owl:Class>

```

### Person.RDF

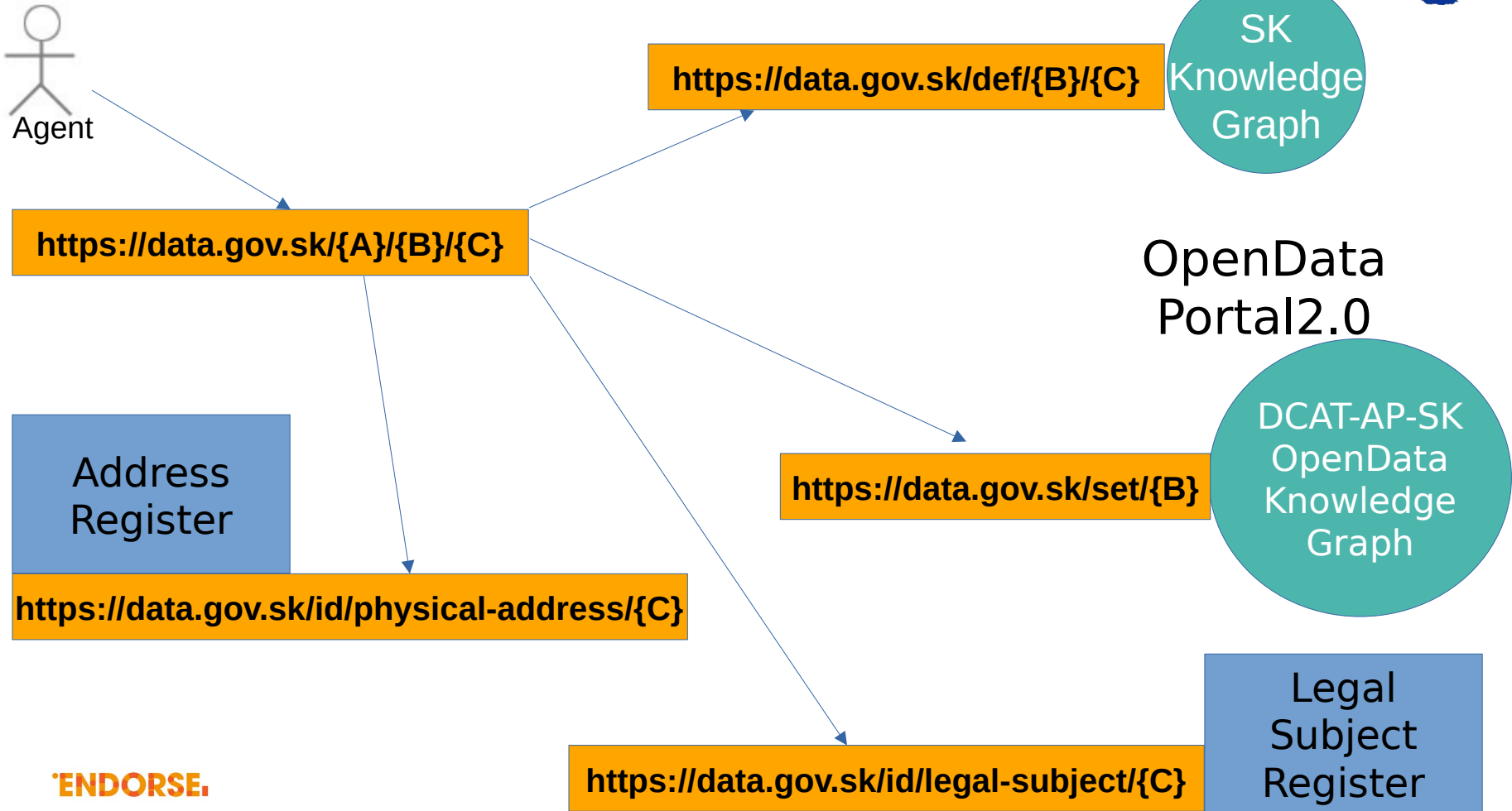


# Part IV.

2022+



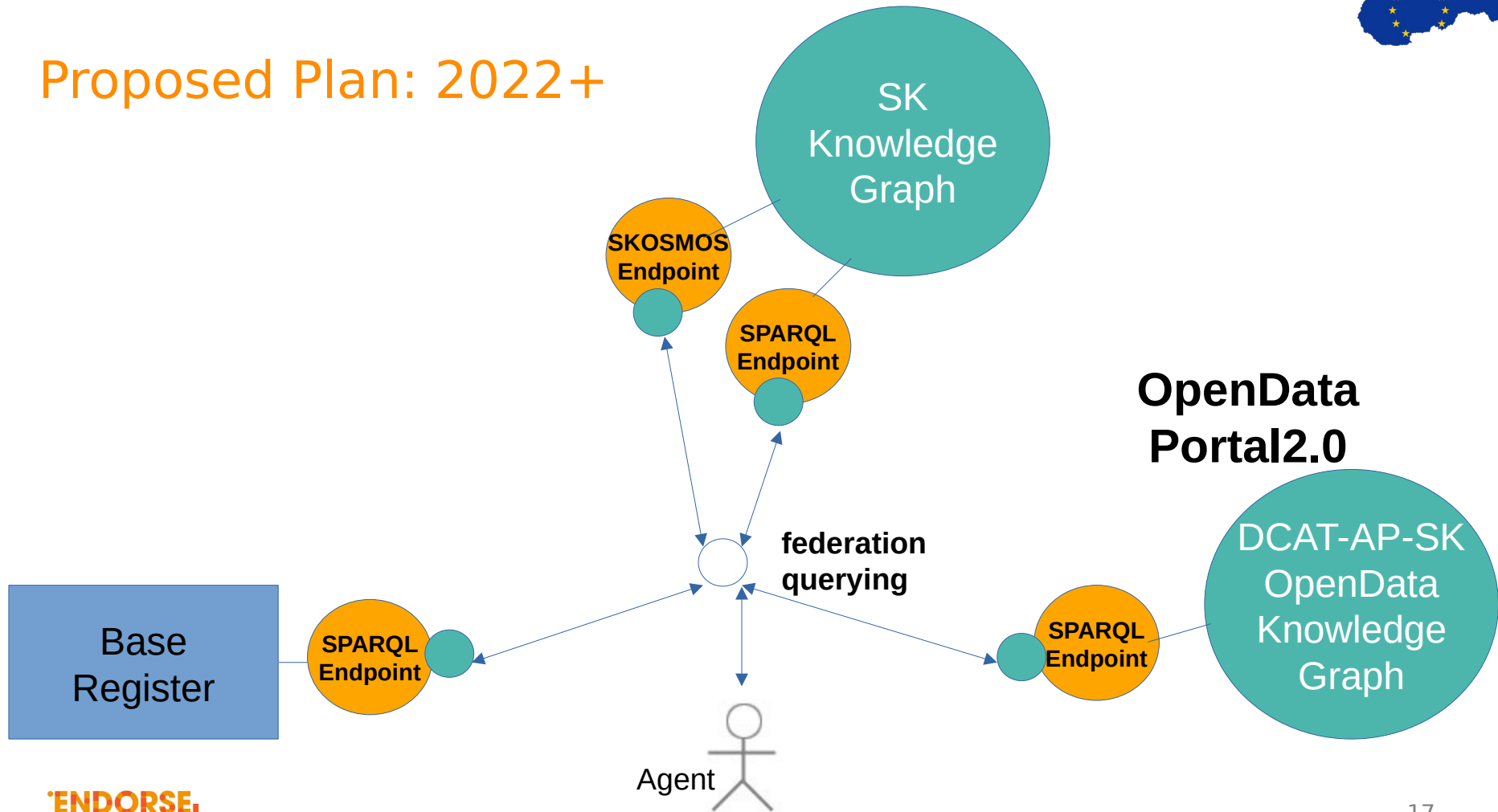
# Public URI dereferencing (Plan)







# Proposed Plan: 2022+





Thank you!



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