TOOP: A Common Semantic Model for the Once-Only Principle

Jack Verhoosel, TNO

June 14, 2018

PROVIDING DATA ONCE-ONLY

Demonstrating the once-only principle across borders by developing a federated architecture

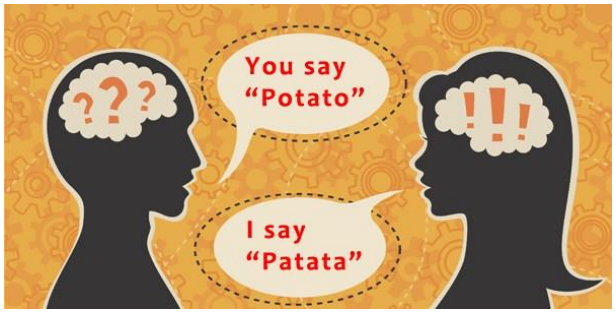
Three pilot areas:

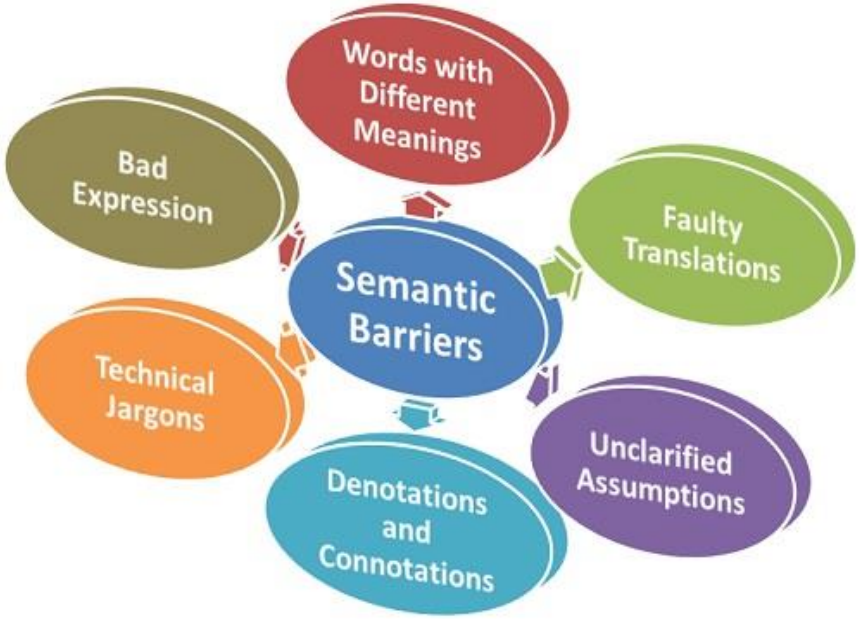
- cross-border e-services for business mobility
- updating connected company data
- online ship and crew certificates

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 737460.

Why a TOOP Common Semantic Model ?

- 28 member states with different terms





- So, let's speak in TOOP terms and use a TOOP Common Semantic Model for that!

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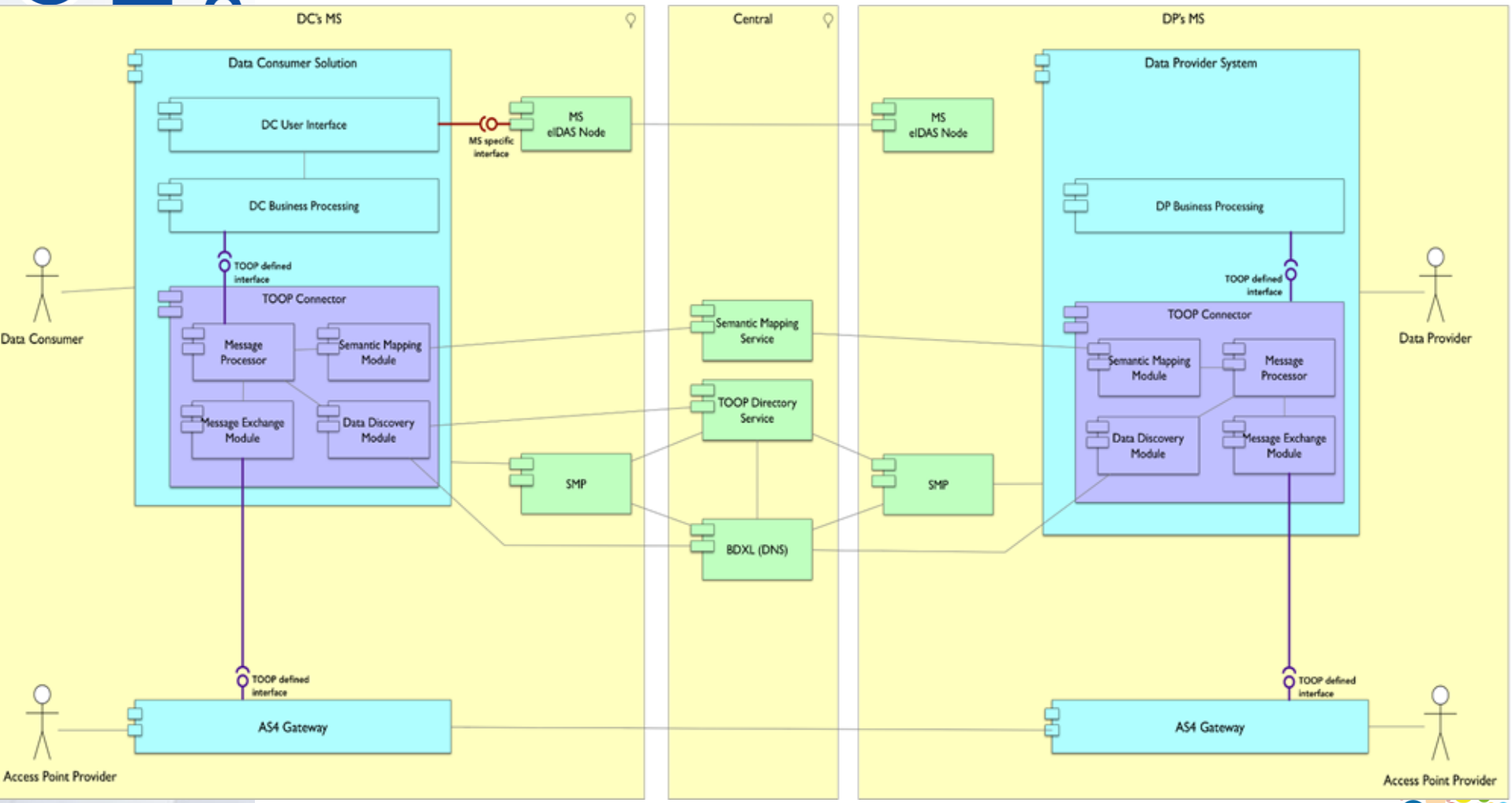
The TOOP Platform



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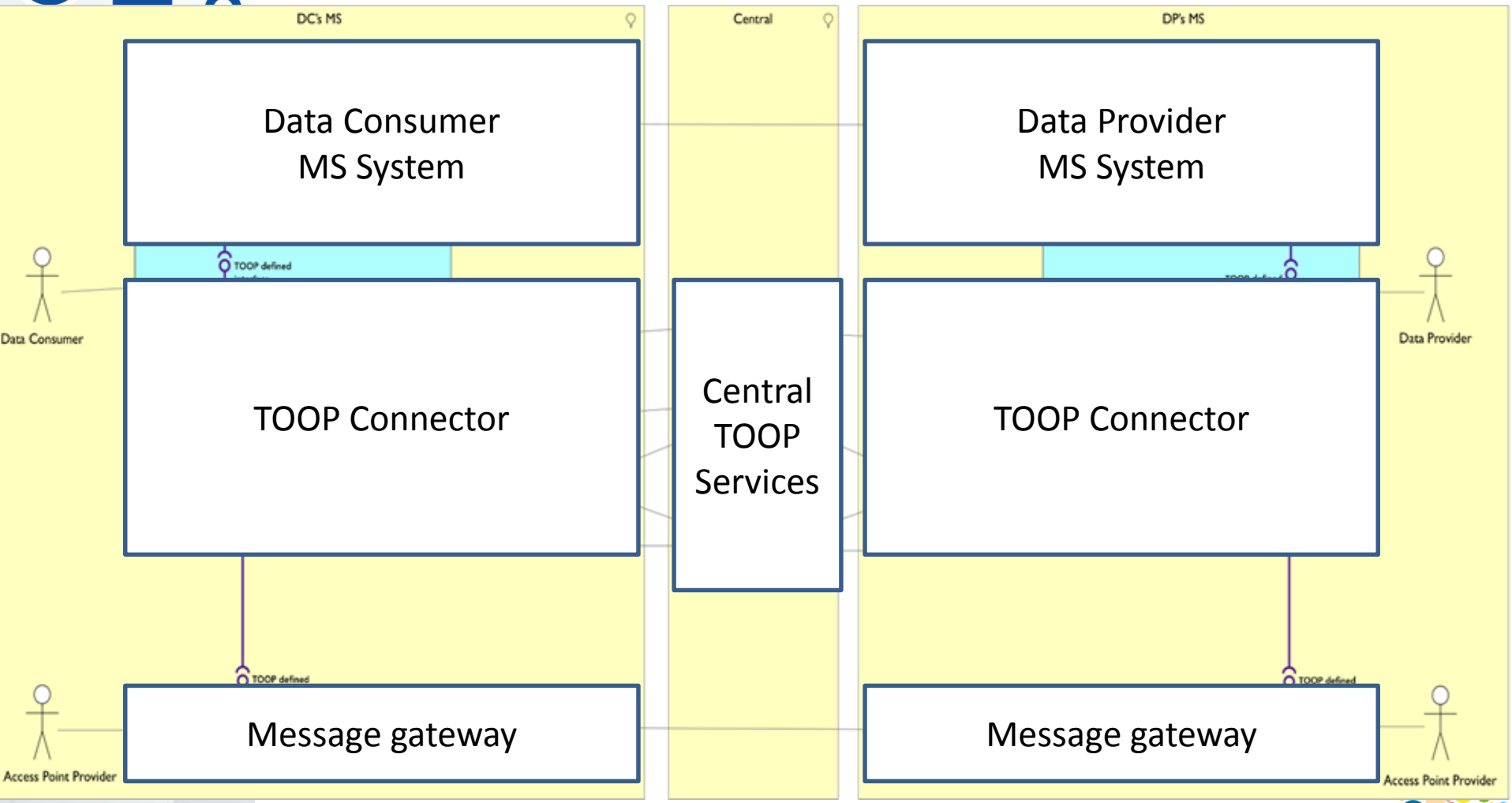

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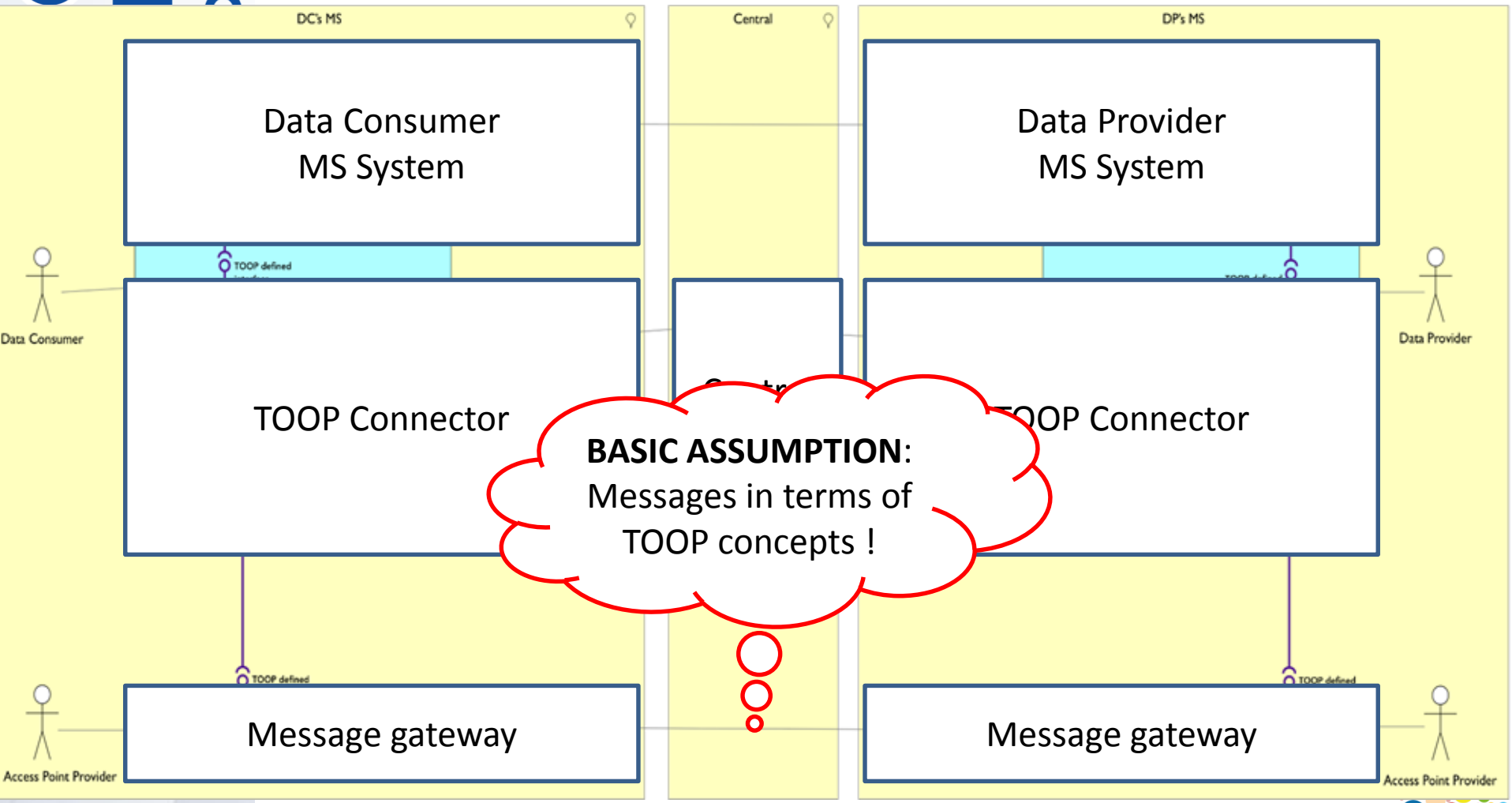

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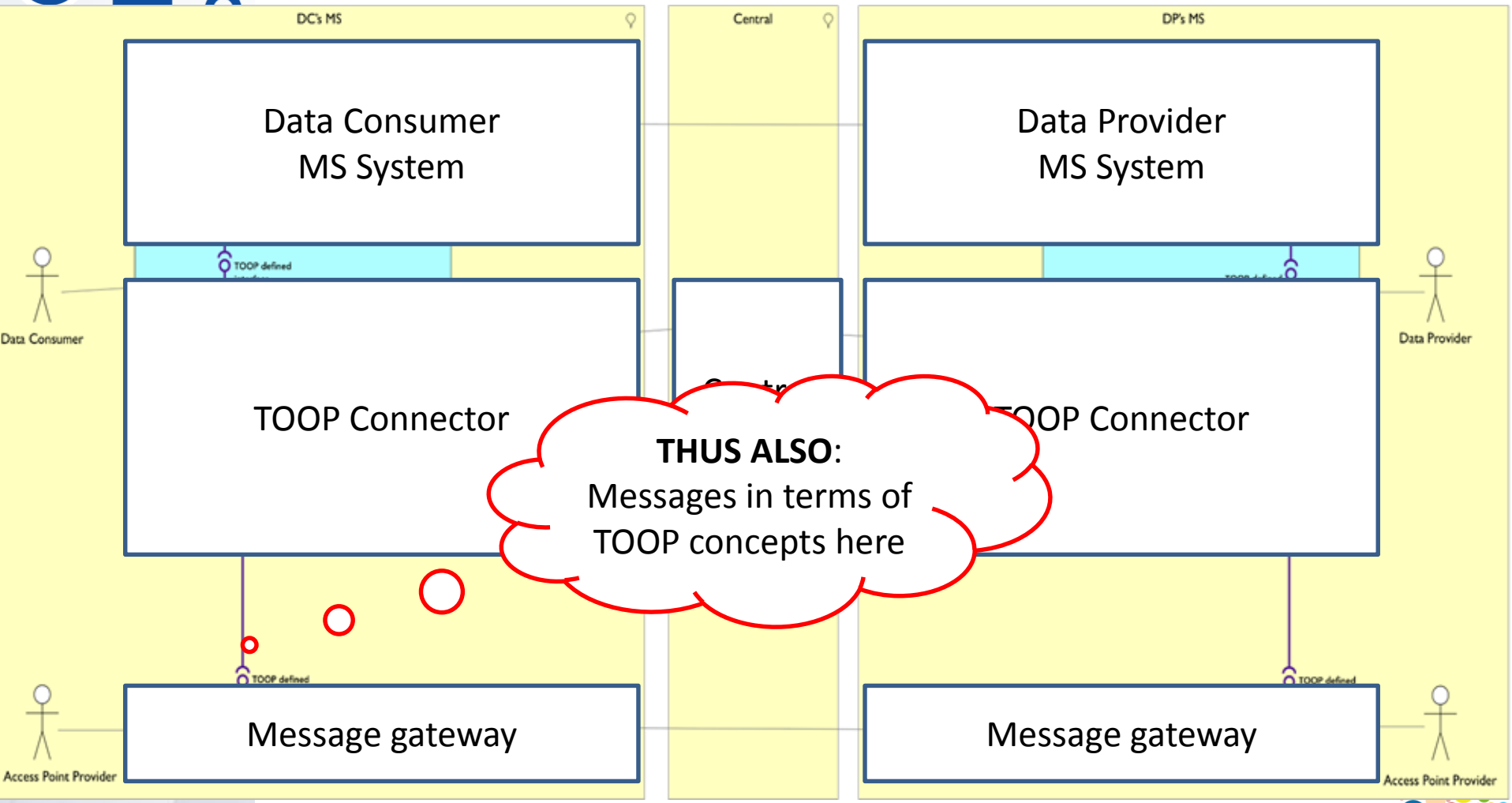

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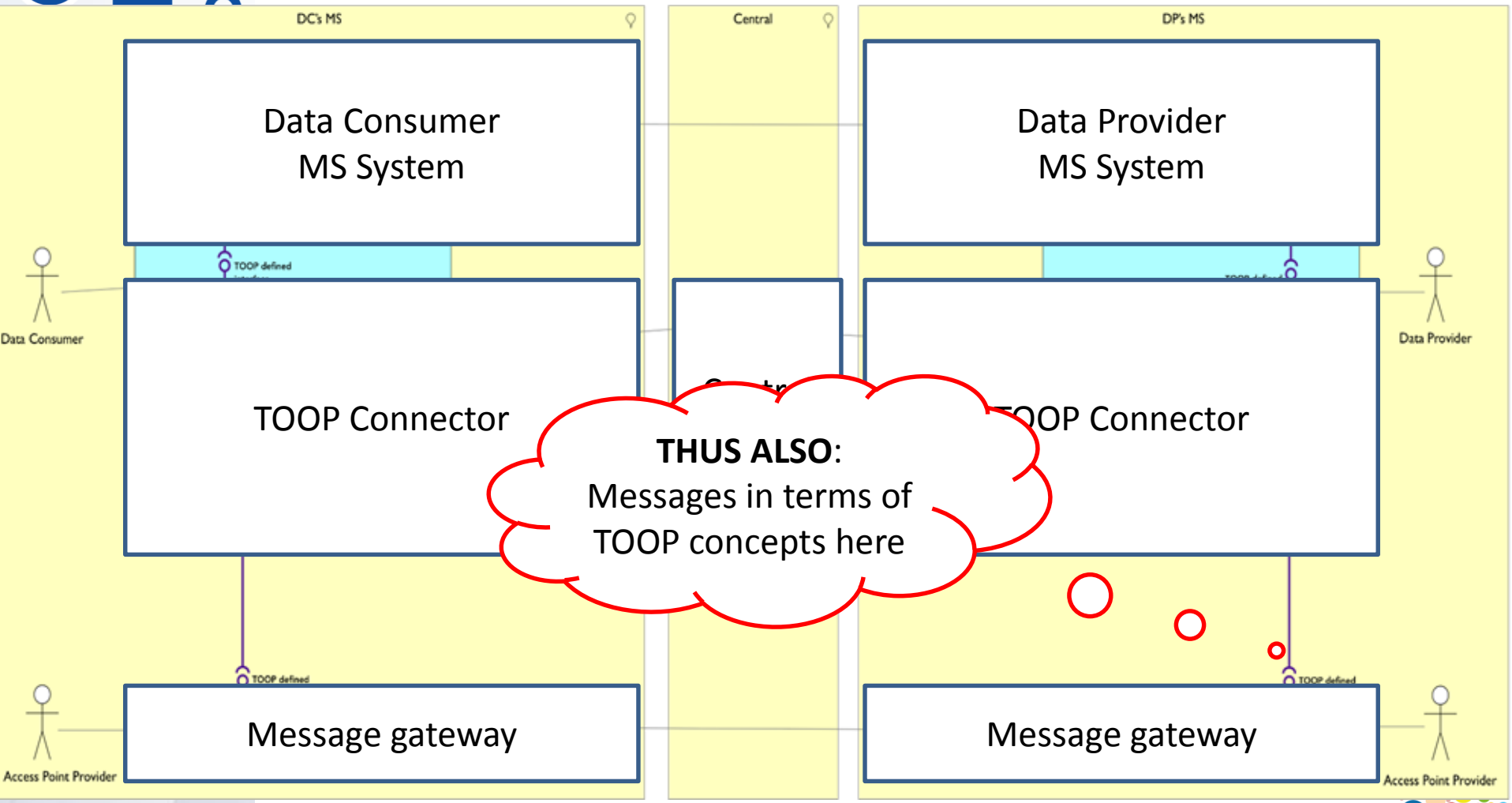

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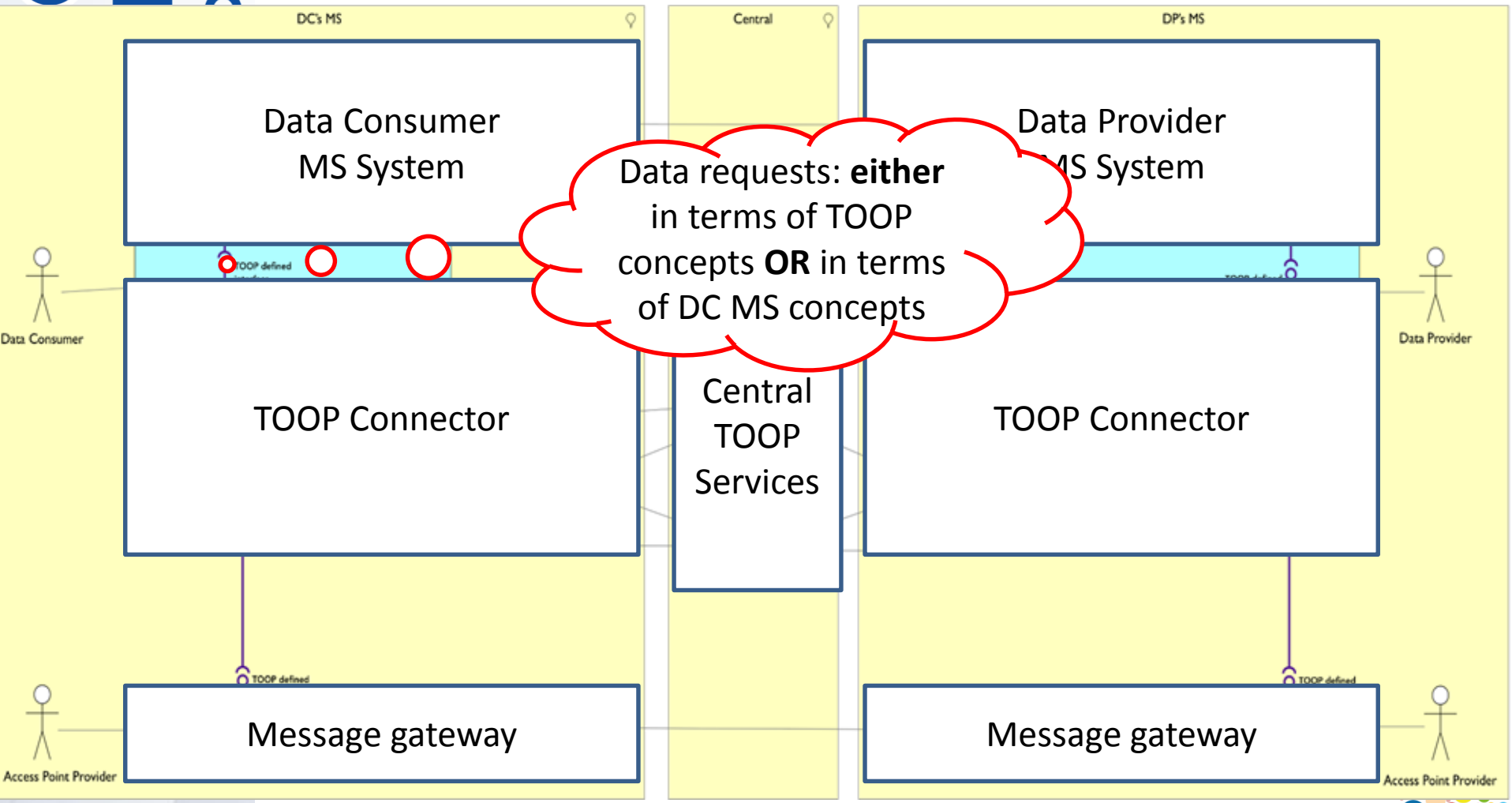

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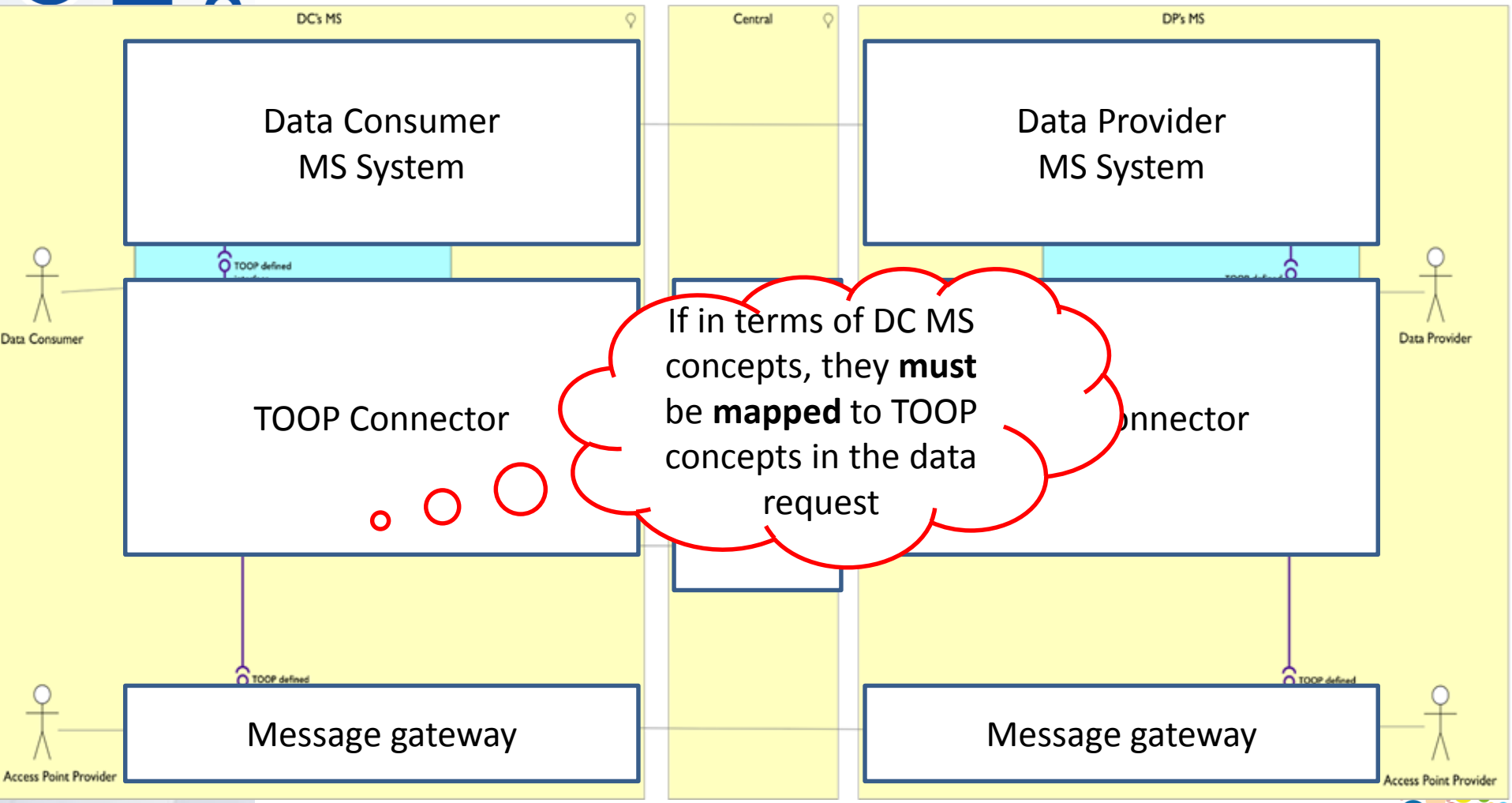

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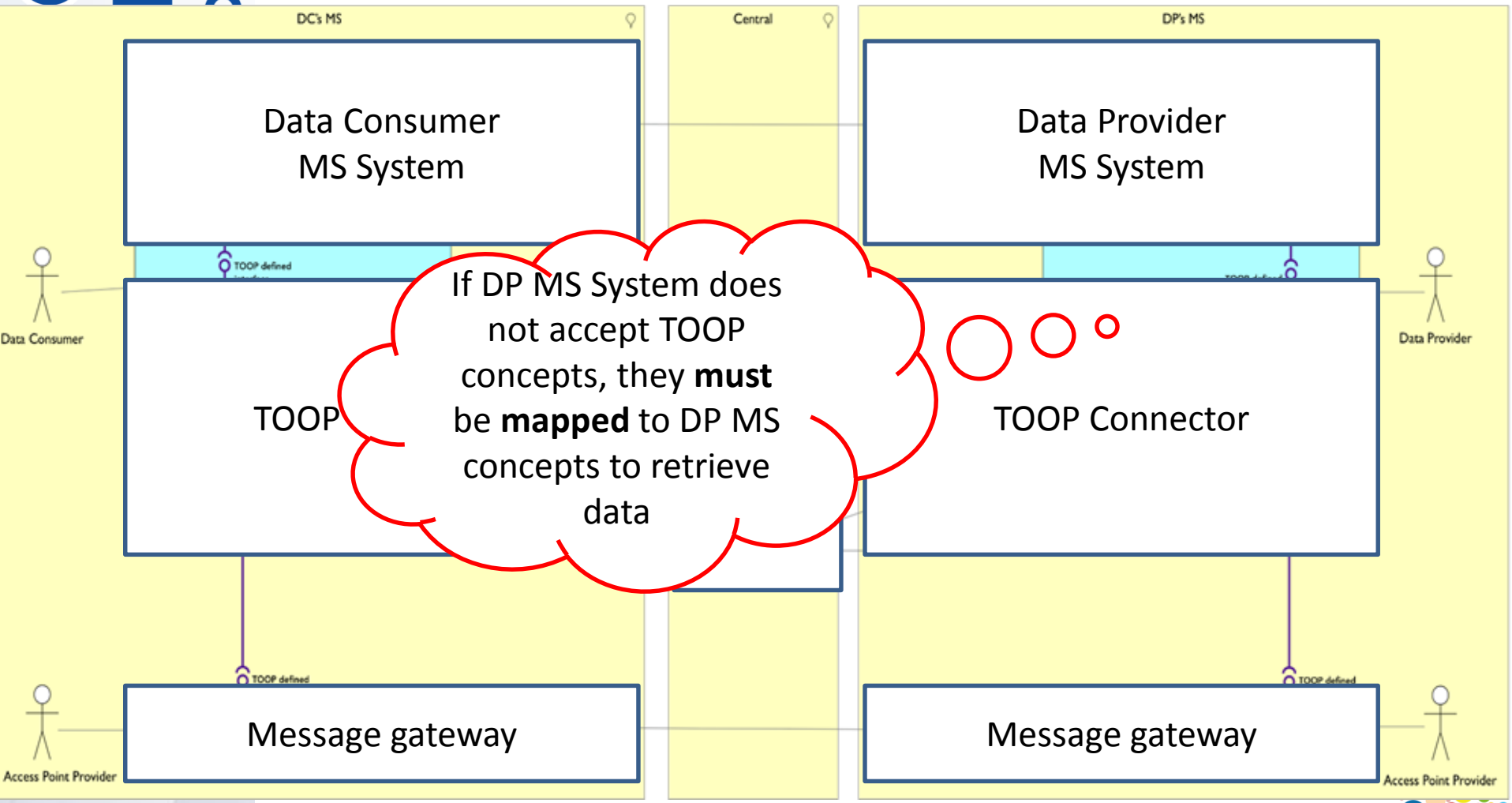

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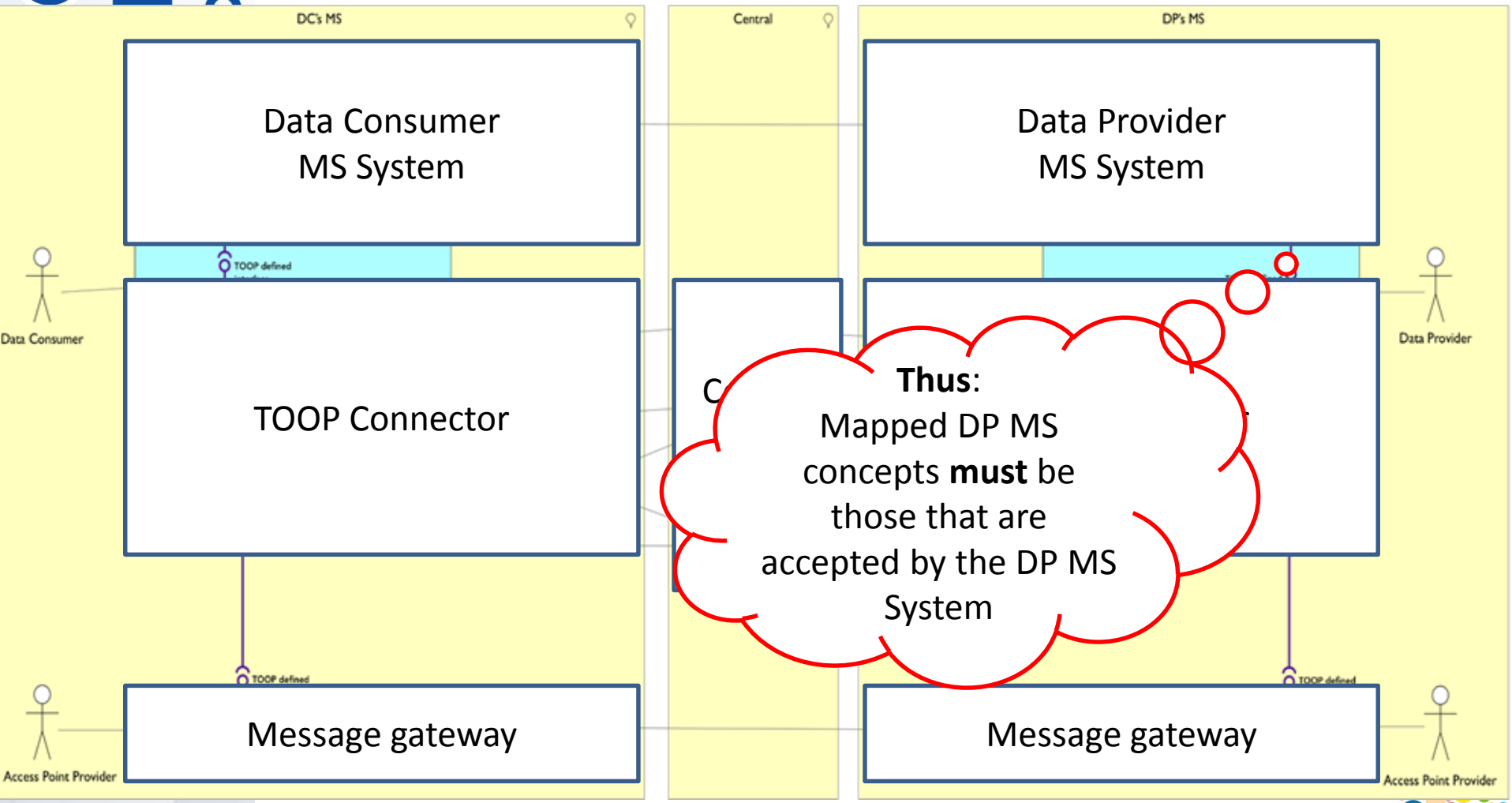

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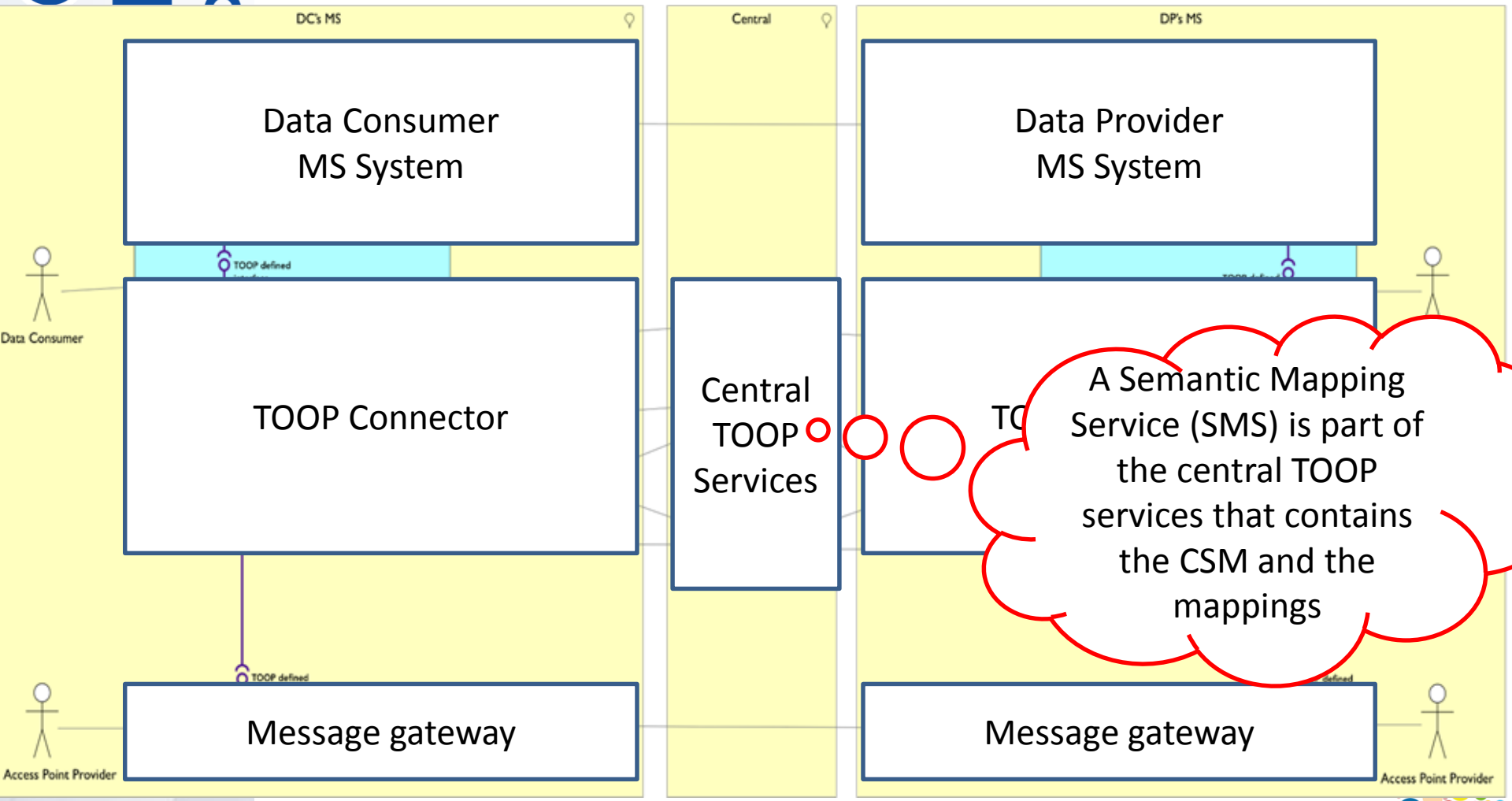

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What to include in the CSM?

- Pilot data superset (snapshot)
- 143 data elements
- A lot of duplicates
- Bad semantics

COUNTRY	
Information systems, registries, and databases / Data objects (MACHINE READABLE)	comments and/or descriptions
TOTALS	
>>Basic Company Identification data<<	
Company Identifier	registration number or code
Legal Company name	full or legal name of entity
Trade Names	commercial or short names
previous company names	
Secondary names	?? What are these
Company names in translation	!! Transliteration might be more important
Legal Form	!! Semantic/legal categorisation and mapping is needed
type of organisation	?? Is this the same as Legal Form
NACE classification	--> add description; ?? Why is demand so low
full date of start/end of commercial activity	?? Ambiguous --> see registration date
company registration/incorporation date	?? Ambiguous, needs splitting
date of cancellation	?? Ambiguous
Alternate company Identifiers	Is there some "common list" of company identifier types?
Commercial Court Register number	covered by "Alternate company identifiers"?
register of associations number	
Trade Register number	covered by "Alternate company identifiers"?
Extract from the Commercial Register (Register of Companies at the Commercial Court)	
record of chamber of commerce registration	covered by "Alternate company identifiers"?
Extract from the Trade Register/Trade Licence - OBRTNO (CRAFT)	
date of suspension, resumption, removal, etc. (PL)	?? Ambiguous
>>Company Address & Contact info<<	
Contact person or persons	
address data	!! choose appropriate standard
telephone number - fixed & mobile	
fax number	
e-mail-address	
web address, issuing authority/ body, precise reference of the documentation	split into separate fields
>>statutory <<	
Date of articles of association	
Articles of association	
object/aim/end/purpose of company	
>>Legal representative<< *--> see >>representatives<< and >>powers<<, below*	--> needs further study in Mandates Scenario of Pilot 1 (is "legal Rep" different from "Rep"?
surname, first name	

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>>Company Address & Contact info<<	
Contact person or persons	
address data	!! choose appropriate standard
telephone number - fixed & mobile	
fax number	
e-mail-address	
web address, issuing authority/ body, precise reference of the documentation	split into separate fields
>>statutory <<	
Date of articles of association	
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- Pilot data superset (snapshot)
- 143 data elements
- A lot of duplicates
- Bad semantics
- Initial dataset for Registered Organization subdomain
- Support pilots and TOOP playground

EBR attributes
CompanyCode
CompanyName
RegistrationAuthority
CompanyType
LegalStatus
LegalStatus EffectiveDate
FoundationDate
RegistrationDate
RegistrationNumber
Capital
Address
Email
FaxNumber
TelephoneNumber
ActivityDeclaration
CompanyNaceCode
SSNumber
VatNumber
LegalRepresentative

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What did we reuse?

- EBR terms and definitions for company profile field names

Company Profile Field Name	**Description**	**Required Field (Mandatory (M)/Optional(O))**	**ebrXML Element**
CompanyCode	This is the unique official company identifier	M	Entity, EntityRegistration, NumberInRegister
CompanyName	This is the official current company name(s) as stored on the Register	M	Entity, EntityRegistration, RegisteredName
CompanyType	This describes the legal type of company	M	Entity, EntityCharacteristic

- All terms in our selected initial dataset were present in the EBR list
- However, no ontology exists for EBR or BRIS!
- **SO……*we started to make it ourselves!***

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What did we reuse?

Domain specific existing ontologies:

- Rov: http://www.w3.org/ns/regorg
  formally ISA2 Registered Organization Core Vocabulary
- Org: http://www/w3/org/ns/org.rdf
- Prov: http://www.w3.org/ns/prov-o
- Vcard: http://www.w3.org/2006/vcard/ns

Generic existing ontologies:

- Adms: http://www.w3.org/ns/adms.rdf
- Dublin core: http://dublincore.org/2012/06/14/dcterms.rdf
- Foaf: http://xmlns.com/foaf/0.1
- Skos: http://www.w3.org/2004/skos/core
- Skosxl: http://www.w3.org/2009/08/skos-reference/skos.rdf

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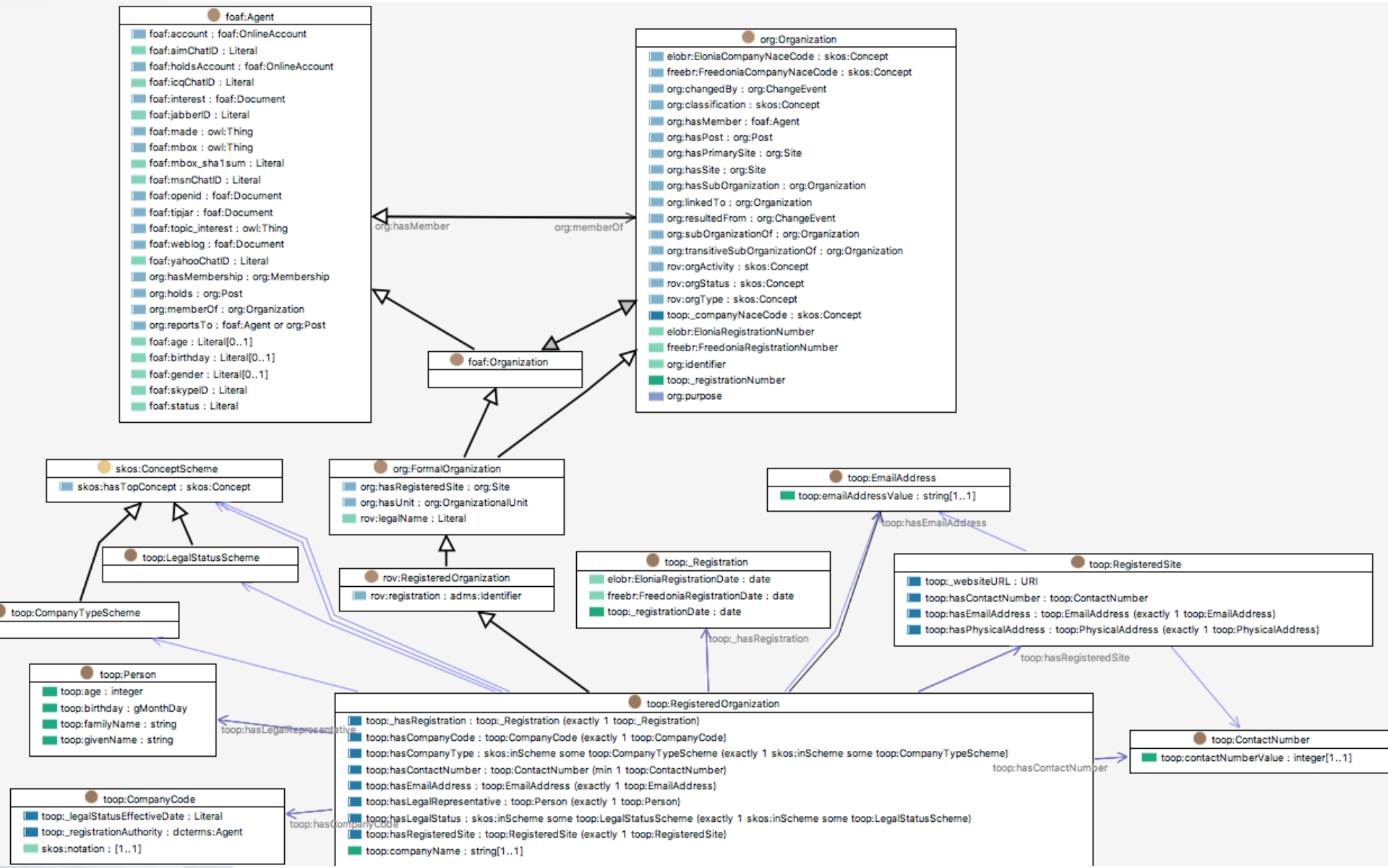

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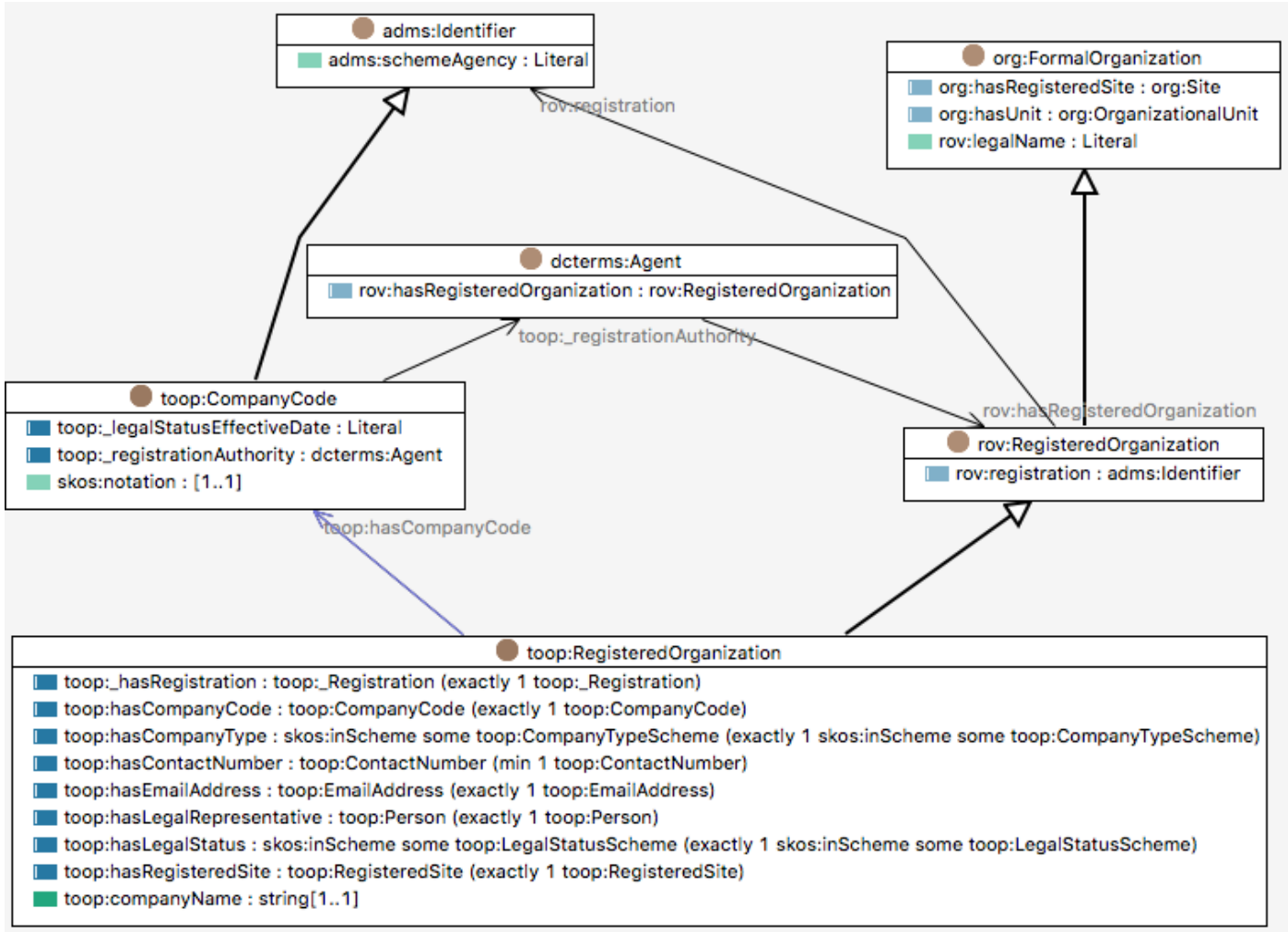
Reuse of rov, org, skos, adms, dcterms



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Mappings: only when needed

- Preferably: use TOOP concepts at the interface with the TOOP Connector!
- If MS want to use MS concepts, they should make a mapping with the TOOP concepts in the CSM.
- There is a semantic mapping guideline to support you: http://wiki.ds.unipi.gr/display/TOOP/Semantic+Mapping+guideline
- To start with, fill in your mapping in the table at: http://wiki.ds.unipi.gr/display/TOOP/National+data+models

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Some example mappings

Sequence no.	TOOP concept	TOOP definition	National concept The Netherlands	National concept Sweden	National concept xxxx
1	CompanyCode	The unique official company identifier	KvK-nummer	Organisationsnummer	
2	companyName	The official current company name as stored in the business register	Handelsnaam	Företagsnamn	
3	companyType	The legal type of the company as part of the CompanyTypeScheme	Rechtspersoon	Företagsform	
4	legalStatus	The legal status of the company (active, ended,...)	RechtsvormRechtspersoon	Status	
5	legalStatusEffectiveDate	The date at which the current legal status became effective.	StatusDatum	?	
6	registrationAuthority	The reference to the official register that has registered the company	KamerVanKoophandel	?	
7	registrationDate	The date at which the company registered at the registration authority	RegistratieDatum	Företagets registreringsdatum	
8	registrationNumber	The number of the company as recorded on the register. In some jurisdictions, the number on the register may be different from the official company number.	not applicable!	?	
9	activityDeclaration	The description of the main activity of the company as free text description recorded on the registry. This tag should be used to give a description of the company activity in the local language.	Activiteit	?	
10	Address	The postal address and/or the visiting address of a physical site of the company.	Locatie	Postadress	

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Namespaces scheme used

- URI Namespace scheme:
  - http://toop.eu/ generic TOOP namespace
  - http://toop.eu/registered-organization for subdomain about registered organization
  - http://toop.eu/financial-data for subdomain about financial company data
  - http://toop.xx/yy for member state XX and subdomain YY
    - http://toop.nl/nhr for the Dutch business register (Nationaal Handels Register)
    - http://toop.de/ureg for the German business register (Unternehmensregister)
    - http://toop.it/regim for the Italian business register (Registro Imprese)
    - Etc…

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1-to-1 mapping constructs

- OWL equivalence and RDFS sub constructs:
  - owl:equivalentClass, owl:equivalentProperty
  - rdfs:subClassOf, rdfs:subPropertyOf

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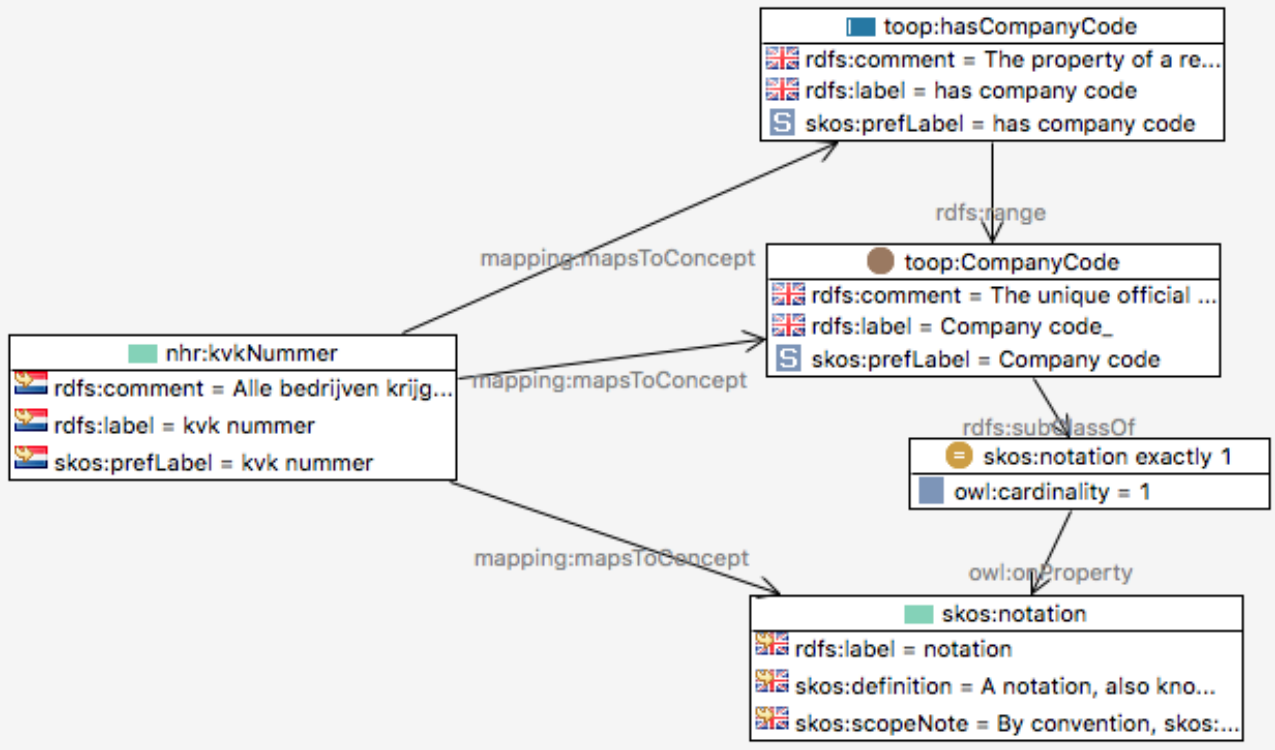
1-to-N mapping constructs

- Specific TOOP properties
  - toop:mapsToConcept, toop:mapsToValue



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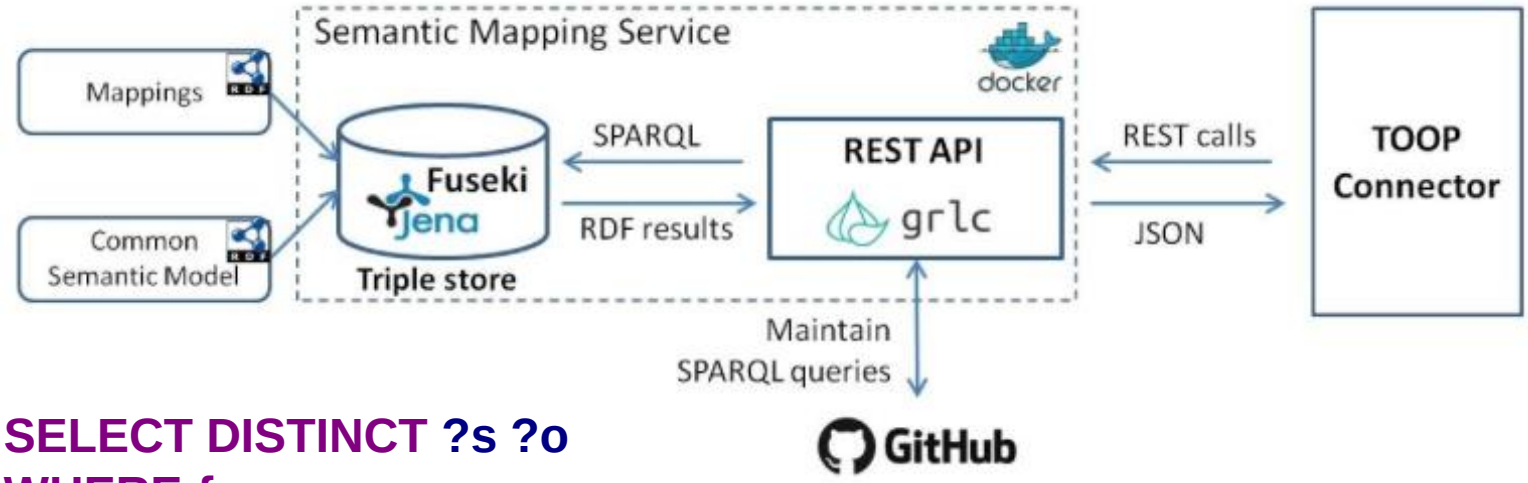
TOOP Semantic Mapping Service

- Get mapping between MS and TOOP




```
SELECT DISTINCT ?s ?o
WHERE {
   ?s ?p ?o .
   FILTER ((?p = rdfs:subClassOf) || (?p = rdfs:subPropertyOf)) .
   FILTER ((STRSTARTS(str(?s), "nhr#") && STRSTARTS(str(?o),
"toop#")) ||        (STRSTARTS(str(?s), "toop#") &&
STRSTARTS(str(?o), "nhr#"))) .
}
```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Next steps

- MS make the mapping from national MS concepts to the TOOP CSM
- Build a simple tool to support the MS in making the mapping:
  - querying currently mapped concepts
  - adding/deleting mappings
- Extend the TOOP CSM with more concepts and subdomains.
- Start discussing governance of the TOOP CSM and the SMS
  - ISA2, CEF?

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European Commission
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Visit us at TOOP's BOOTH

Exhibition: 7th floor, Hall 3

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