The ESCO platform for NKOS integration

Invited European NKOS-2014 Workshop contribution

by

johan.de-smedt@tenforce.com   agis.papantoniou@tenforce.com

ESCO: European Skills, Competences and Occupations
NKOS: Networked Knowledge Organization Systems

Part 1: What is ESCO

ESCO main reference

- ESCO
  - https://ec.europa.eu/esco/home
  - European Skills, Competences, Qualifications and Occupations
    - [DG Employment, Social Affairs and Inclusion](#) and [DG Education and Culture](#) of the European Commission develop ESCO in collaboration with stakeholders and with the [European Centre for the Development of Vocational Training (Cedefop)](#). An H2020 initiative.

EC: European Commission
DG: directorate general
H2020: Horizon 2020, EC programme for Research and Innovation

ESCO objective (1/2)

- Provide the EU with a set of cross boarder multi-lingual vocabularies to facilitate EU job market transparency by using the ESCO thesauri as a hub for translating and encoding CV and Job Postings.
  - A set of thesauri/taxonomies (three "pillars"):
    - Occupations
    - Skills and competences
    - Qualifications (certifications)
  - Semantic relationships between concepts of the three pillars
    - Occupations and Skills/Competences: essential and optional skills for an Occupation
    - Occupations and Qualifications: Qualifications required for an Occupation
    - Qualifications an Skills/Competences: Skills asserted by a Qualification (certificate)
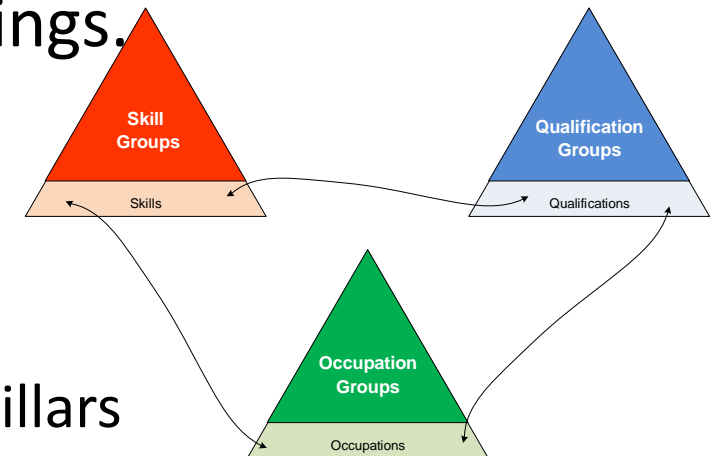
ESCO objective (2/2)

- A hub taxonomy for labor market players

- Compose
  - exactMatch **o** exactMatch
  - exactMatch **o** closeMatch
  - exactMatch **o** broadMatch
  - broadMatch **o** exactMatch
  - exactMatch **o** narrowMatch
  - narrowMatch **o** exactMatch
  - broadMatch **o** broadMatch ⊃ esco:broadTransitiveMatch
  - narrowMatch **o** narrowMatch ⊃ esco:narowTransitiveMatch

ESCO is a hub thesaurus for mapping like classification system about either of
- occupation
- skill
- qualification

ROME

ESCO

O*Net

ISCO, PES,...
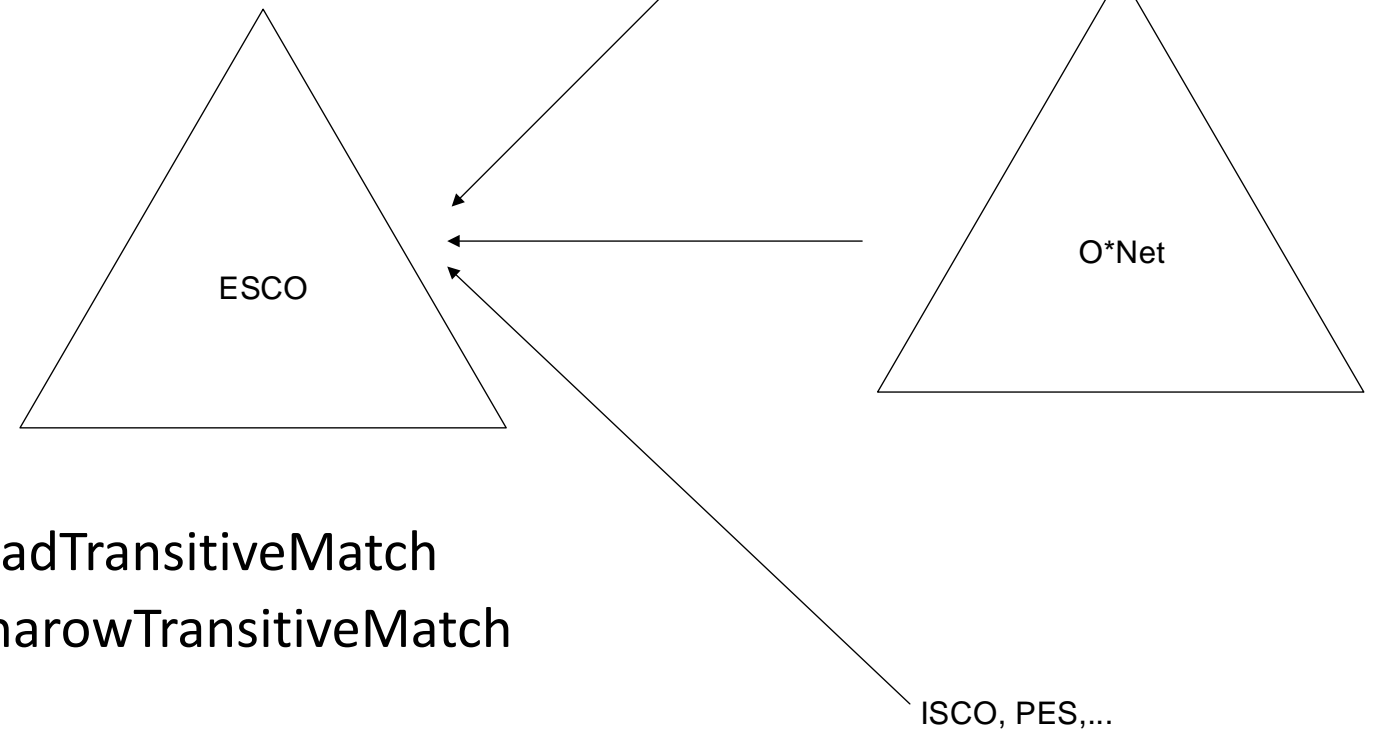
ESCO Current Status

- ESCO versions
  - Version 0 is currently published

  - Version 1 is currently ongoing and will make partial upgrades (v0.1, v0.2 …) until v1 is established (from end 2013 until early 2017).

  - Version 0.1 is targeted for publication on 2015-02.
    - Improvements for 3 sectors:
      - Agriculture, Forestry and Fishery;
      - Hospitality and tourism;
      - Veterinary

ESCO v0 on the Web

- Home
  https://ec.europa.eu/esco/home

Part 2: ESCO as an NKOS system

The ESCO NKOS platform

ESCO KOS

- Three main taxonomies
  - Top structure is a hierarchy of classes or groups
  - Lower structure is a hierarchy of instances
- Two registers

Work context

Occupation Groups
Occupations

Skill Groups
Skills

Qualification Groups
Qualifications

Awarding body
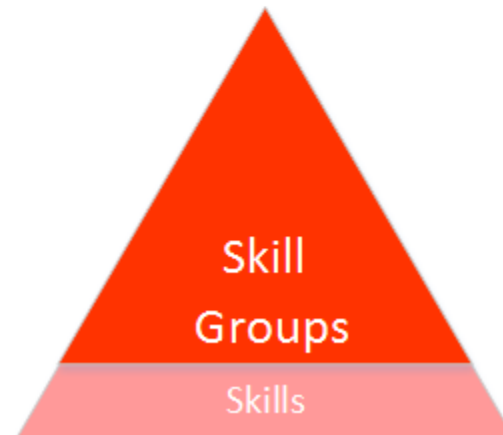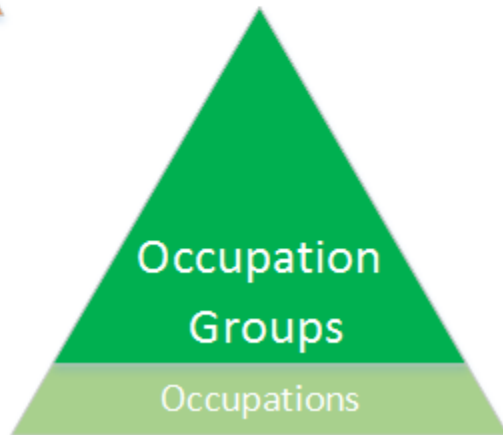
Occupation

- Example of other used vocabularies
  - Languages (Publication Office, Library of Congress)
  - CERF (Common EU reference framework for languages)
  - Countries
  - NUTS (Eurostat EU regions)
  - EQF (European Qualification Framework)
  - FoET (Unesco Fields of education and training)

The ESCO NKOS platform
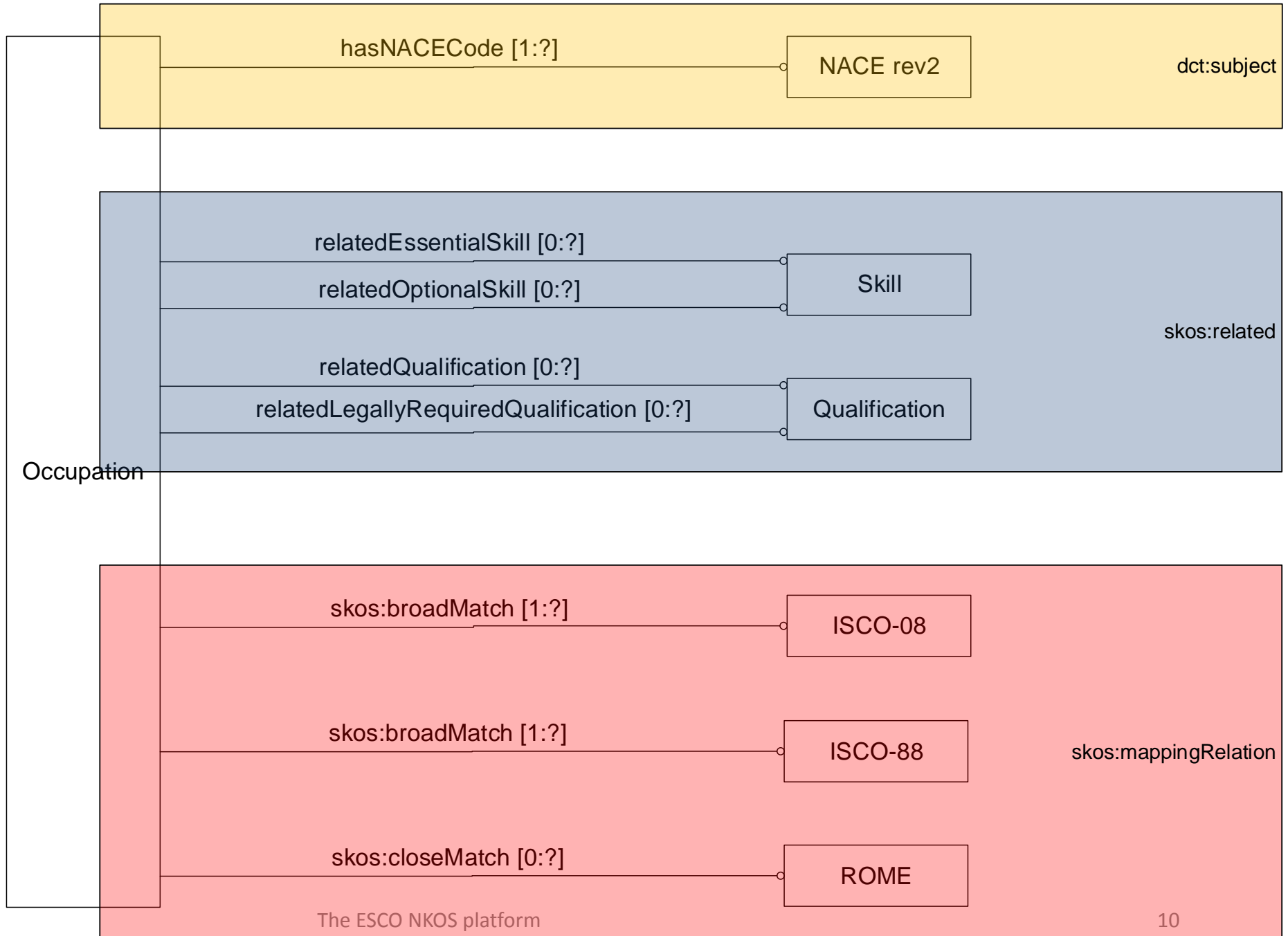
ESCO v1 Tagging Occupations with one or more dct:subject ranging over NACE codes

ESCO occ pillar

AFF sector

dct:subject

AFF

- Fishery

O [Occupation][Member]

NACE

- A: AGRICULTURE, FORESTRY AND FISHING

- B: MINING AND QUARRYING
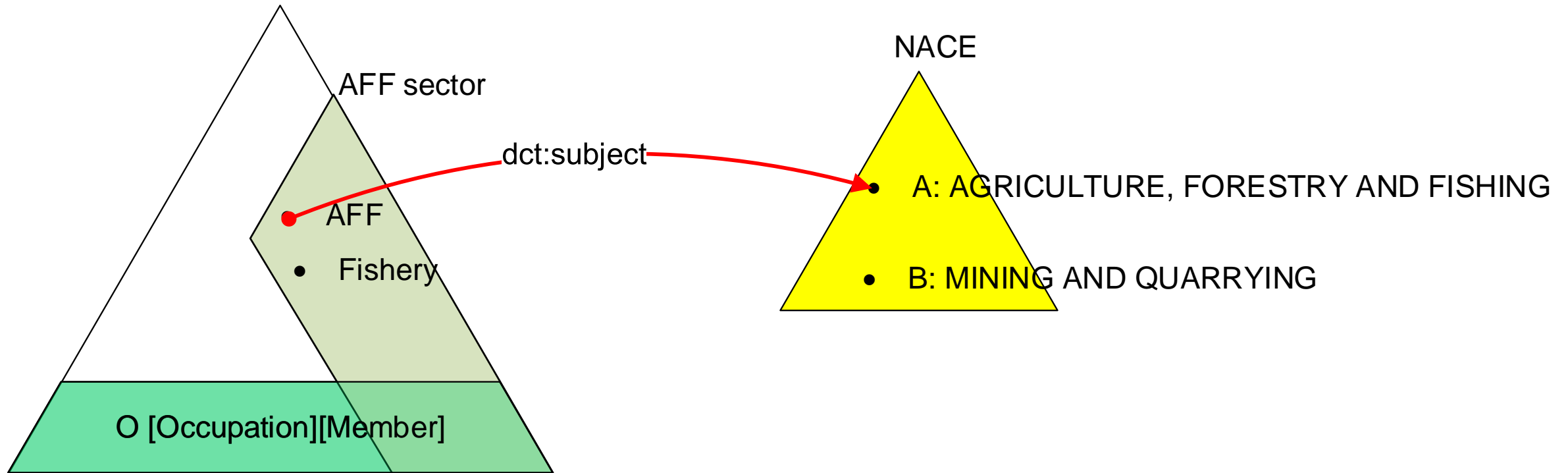
ESCO v1
Mapping relationships

ISCO-88 Occupation Groups

5123: Waiters, waitresses and bartenders

skos:broadMatch

ESCO Occupation Groups

ESCO Occupations

waiter/waitress

ISCO-08 Occupation Groups

5131: Waiters
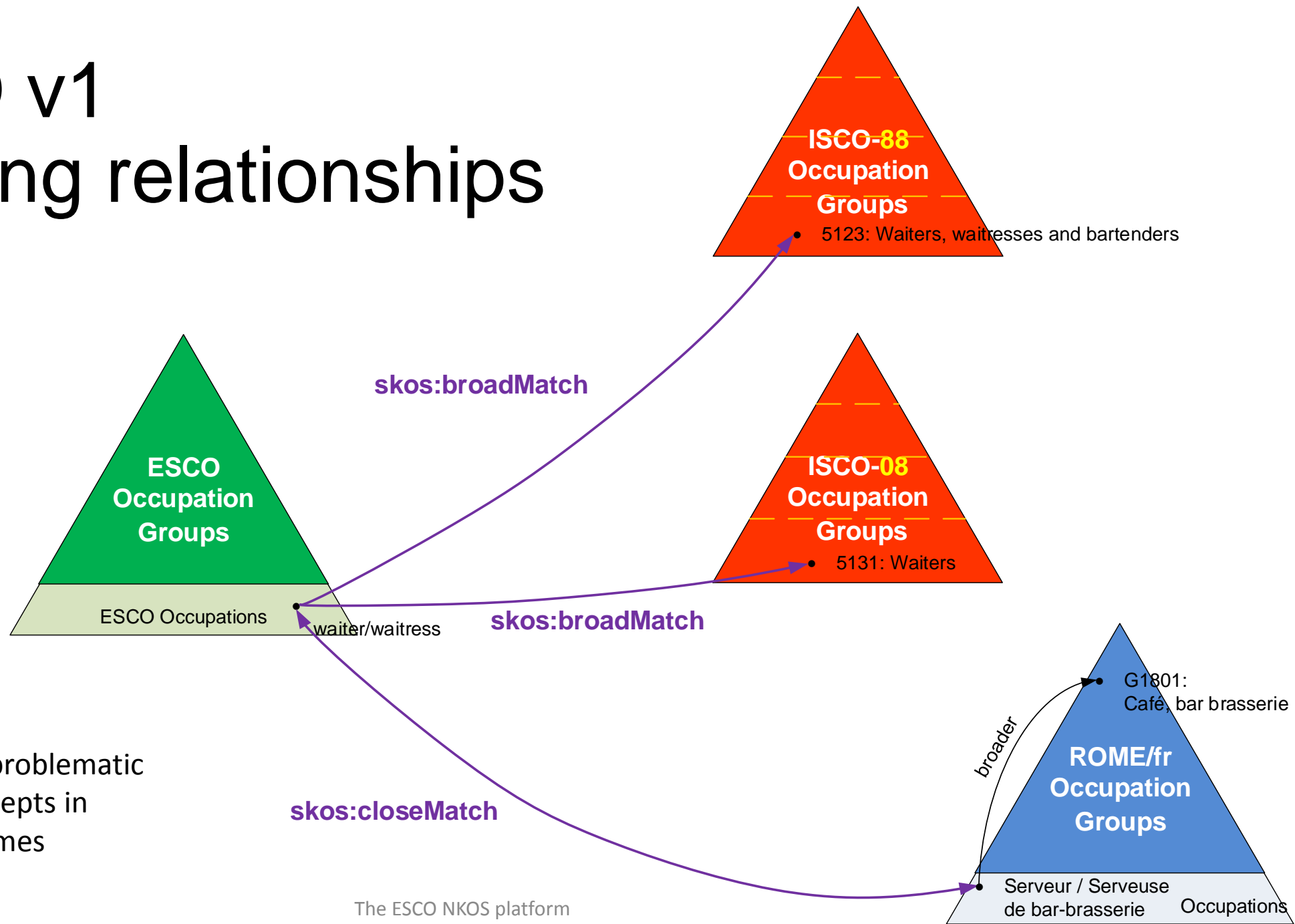
skos:broadMatch

Accuracy is sometimes problematic
- different scope of concepts in
different concept schemes

skos:closeMatch

G1801:
Café, bar brasserie

broader

ROME/fr Occupation Groups

Serveur / Serveuse
de bar-brasserie

Occupations

TenForce

The ESCO NKOS platform

Inconvenience

- When mapping concepts in different skos:ConceptScheme, the rdfs:subPropertyOf between
  - skos:mappingRelation (skos:broadMatch, skos:narrowMatch) properties and the respective
  - skos:semanticRelation (skos:broader, skos:narrower) properties

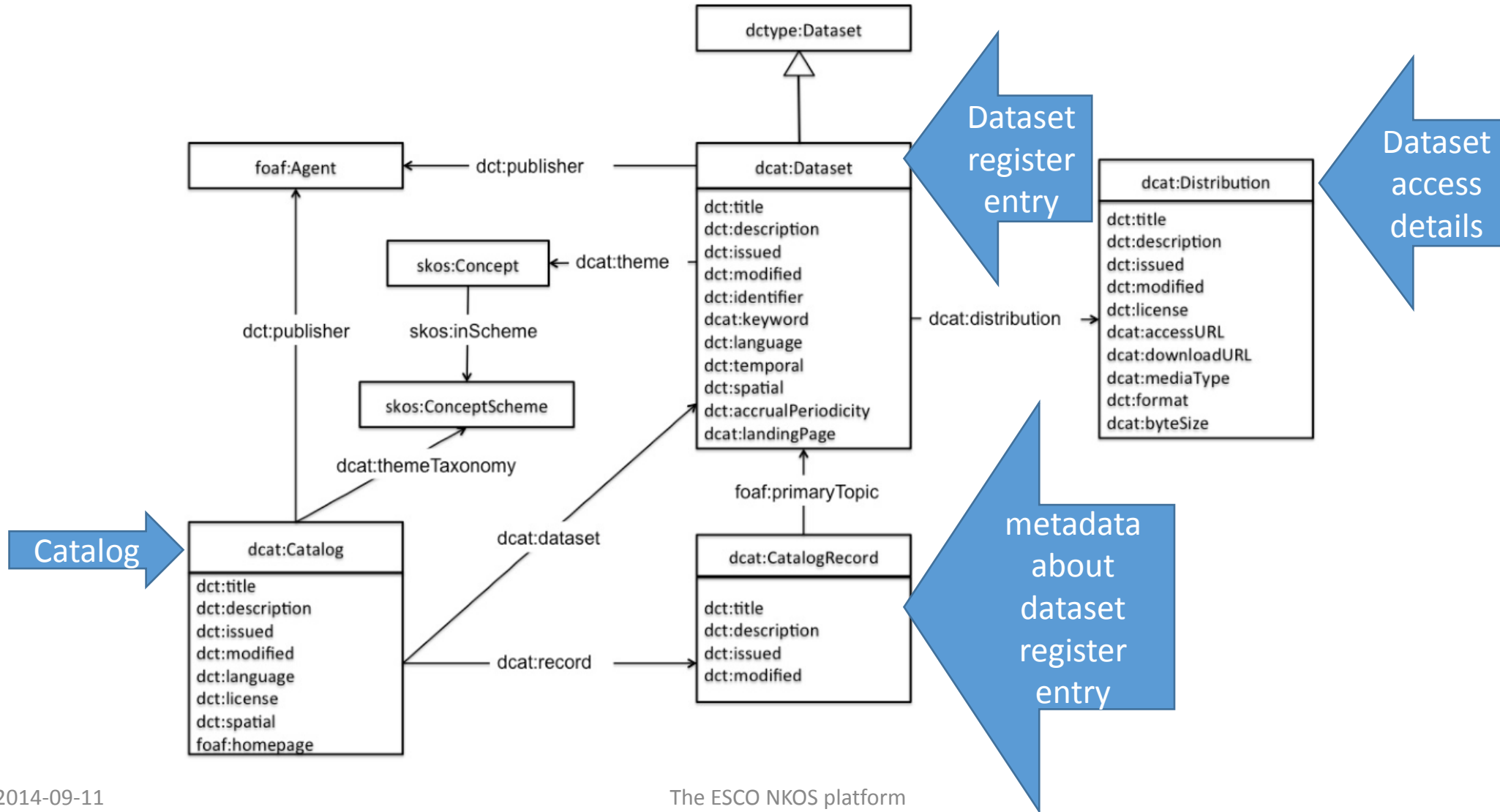 Typically gets problematic as it makes a dependency between the hierarchies in the different concept schemes

- Proposal
  - Make the mentioned property hierarchy not a required part of SKOS or SKOS-XL, but use them as a possible SKOS extension.
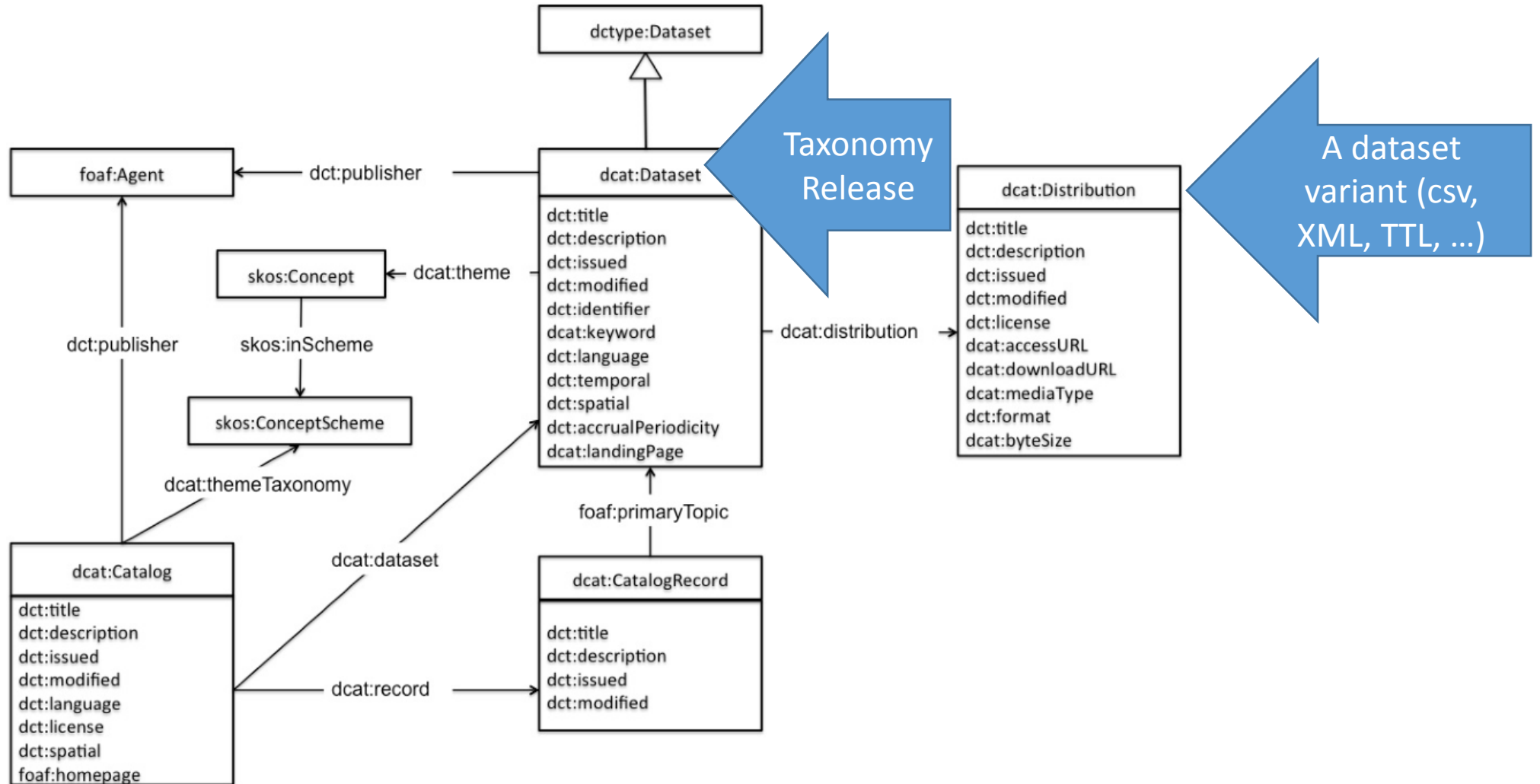
Part 3: Versioning

Versioning – modelling

- Dataset versioning based
  - DCAT (http://www.w3.org/TR/vocab-dcat/),
  - ADMS (https://joinup.ec.europa.eu/asset/adms/home)
    for dataset and resource versioning

- Versioning ontology for thesaurus or dataset versions
  - Development:
    https://github.com/JohanDS/Dataset-versioning--for-KOS-data-sets
  - Availability: http://purl.org/iso25964/DataSet/Versioning

- Publication Office of the EU
  (future work – see WS presentation Jean Delahousse)
  - Concept and Label versioning
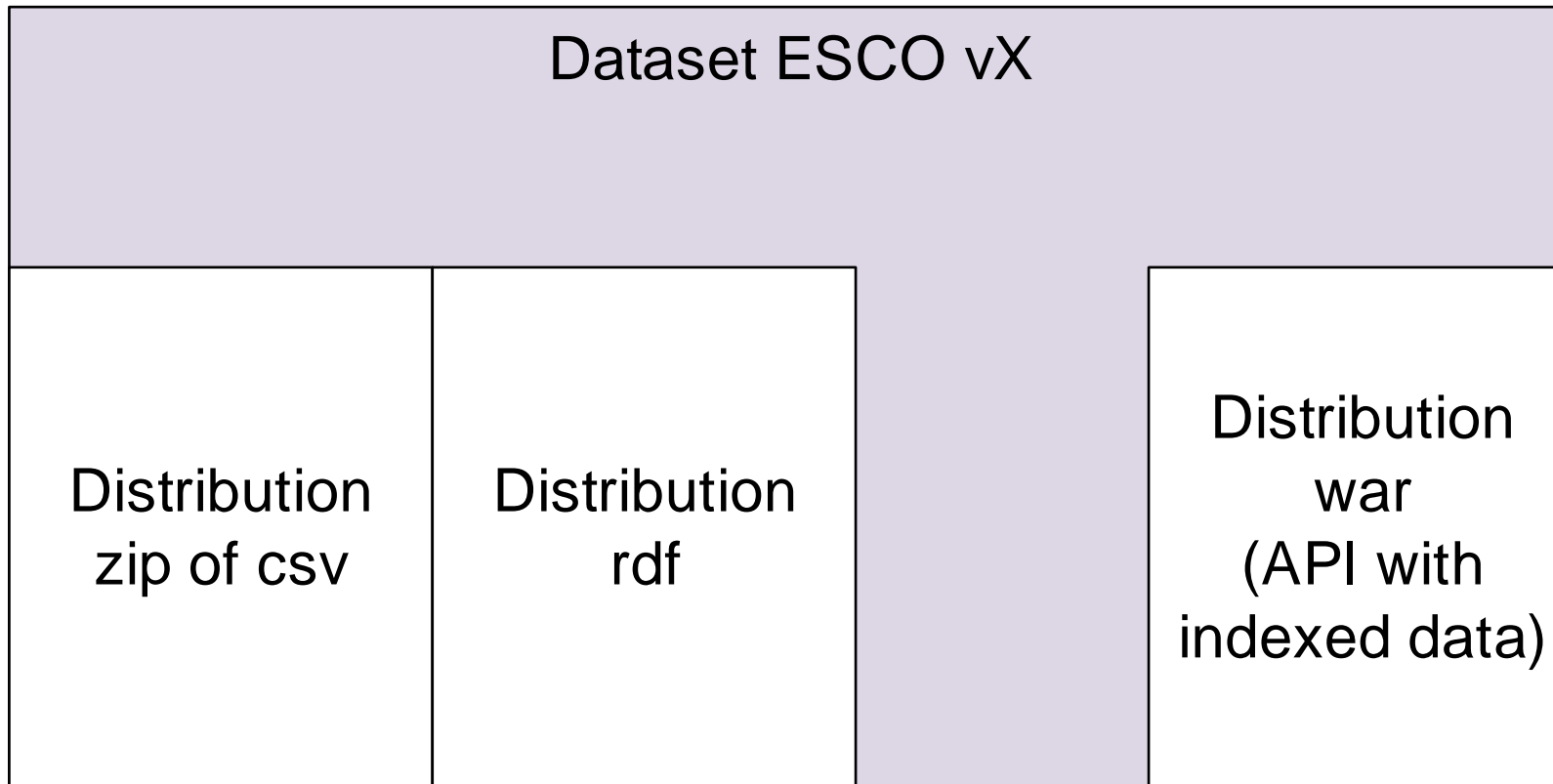   - PROV-O (http://www.w3.org/TR/prov-o/), ADMS, Dublin Core

DCAT – a catalog ontology

DCAT – a catalog ontology

DCAT Register Entry for ESCO

Dataset ESCO vX

Distribution zip of csv

Distribution rdf

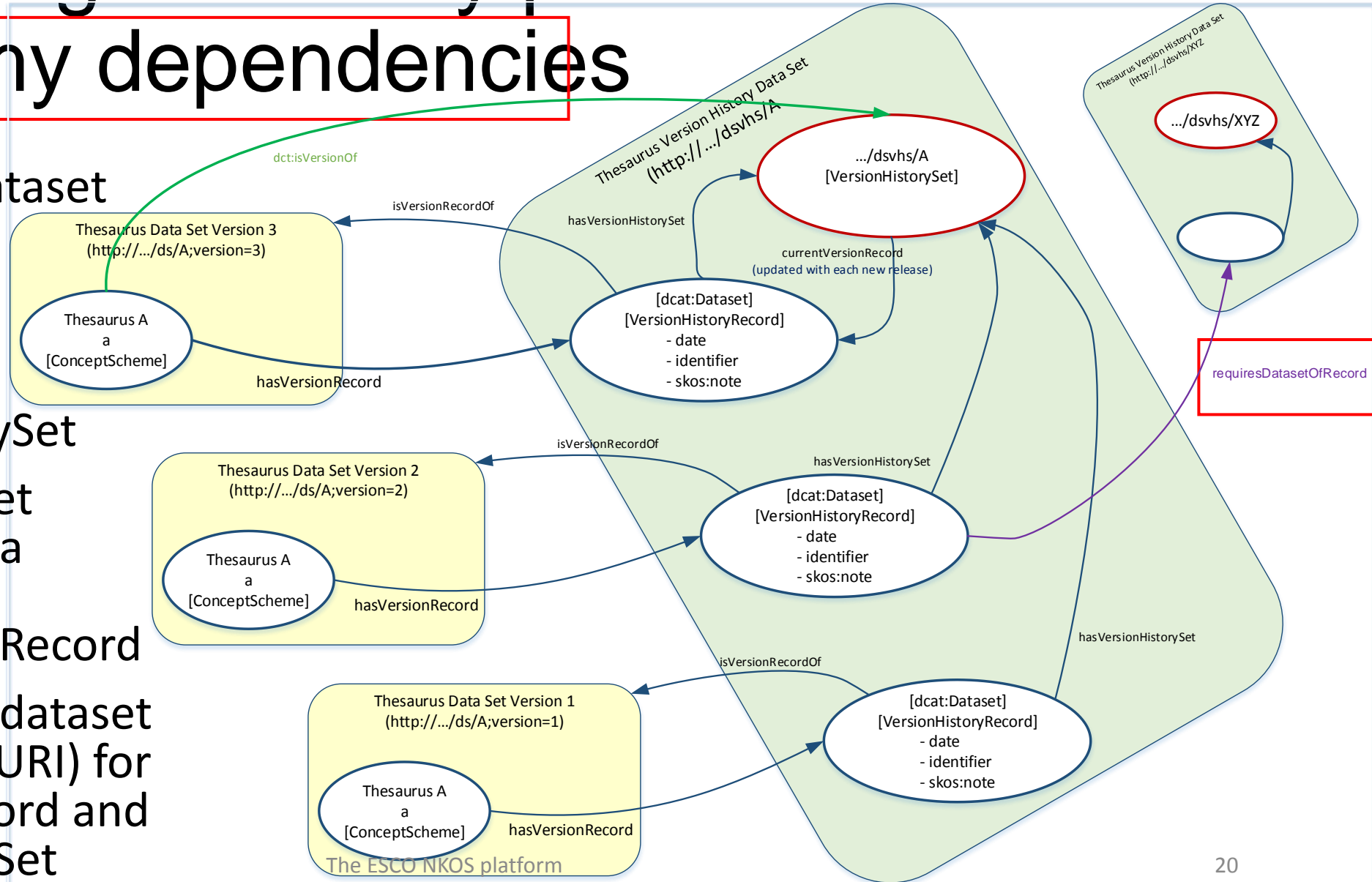Distribution war (API with indexed data)

DCAT register with entries for ESCO versions

- Two ESCO versions in the register

- Two versions of ISCO in the register

- The ESCO version control graph, a registered dataset.

ESCO DCAT catalog		
Dataset ISCO-08		
c	r	
Dataset ESCO v1		
c	r	w
Dataset ISCO-88		
c	r	
dataset ESCO v0		
c	r	w
ESCO Version history dataset		
c	r	

Versioning taxonomy publications and taxonomy dependencies

- Per thesaurus, one dataset with fixed URI manages the taxonomy dataset releases, LOD access i.e. the VersionHistorySet

- Each thesaurus dataset release is detailed by a DCAT dataset record i.e the VersionHistoryRecord

- A released thesaurus dataset holds an identifier (a URI) for its VersionHistoryRecord and to the VersionHistorySet

The ESCO NKOS platform

20

Part 4: Thank you

- Q&A