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Mapping of GBIF concepts to the CSW ISO Application Profile

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Interoperability has become a key concept amongst scientific communities, in particular with the focus of heterogeneous data discovery and access as well as services discovery. Our work is developed in the context of the Global Earth Observing System of Systems (GEOSS) Interoperability Process Pilot Project and it demonstrates the feasibility of interoperability between different communities.

The Global Biodiversity Information Facility (GBIF) provides through its web portal and services a huge amount of primary species occurrence data, acquired and unified from different data providers. GBIF uses standards relevant to the biodiversity community (e.g. Darwin Core, Taxon Concept Schema), as well as newly introduced concepts and interfaces.

The Open Geospatial Consortium (OGC) Catalogue Service for the Web (CSW) is a service that can perform discovery of geospatial data and services, returning results in the form of profiled metadata. In particular the ISO Application Profile (AP) defines a particular set of metadata well known in the geospatial community (ISO 19115/ISO 19119).

We make GBIF biodiversity data and services available through a CSW ISO AP catalog; this is done by means of a mapping of the GBIF data model and GBIF services to their CSW ISO AP equivalents.

Regarding the data model mapping, the main work was to design the mapping be-

tween the concepts, then a series of rules was implemented to translate between XML instances of GBIF data and the XML documents of the CSW ISO AP.

At the semantic level, firstly we identified a hierarchical structure in the GBIF data model concepts and decided to map it to the hierarchical structure of the CSW ISO AP data model. The GBIF portal REST interface was mapped to an ISO service instance with service type “GBIF”, while the hierarchy of GBIF data providers and resources was mapped to a correspondent ISO hierarchy, composed of datasets and dataset collections. The taxonomy concepts of GBIF were also mapped to ISO metadata through a special mapping. Other metadata elements were also successfully translated (e.g. contact info, temporal and geospatial metadata).

We can thus use a CSW ISO AP client to perform discovery of biodiversity data as well as geospatial data, allowing higher level applications to be written on top of it.