A SOA broker solution for standard discovery and access services: the GI-cat framework

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GI-cat ideal users are data providers or service providers within the geoscience community. The former have their data already available through an access service (e.g. an OGC Web Service) and would have it published through a standard catalog service, in a seamless way. The latter would develop a catalog broker and let users query and access different geospatial resources through one or more standard interfaces and Application Profiles (AP) (e.g. OGC CSW ISO AP, CSW ebRIM/EO AP, etc.). GI-cat actually implements a broker components (i.e. a middleware service) which carries out distribution and mediation functionalities among "well-adopted" catalog interfaces and data access protocols.

GI-cat also publishes different discovery interfaces: the OGC CSW ISO and ebRIM Application Profiles (the latter coming with support for the EO and CIM extension packages) and two different OpenSearch interfaces developed in order to explore Web 2.0 possibilities. An extended interface is also available to exploit all available GI-cat features, such as interruptible incremental queries and queries feedback.

Interoperability tests performed in the context of different projects have also pointed out the importance to enforce compatibility with existing and wide-spread tools of the open source community (e.g. GeoNetwork and Deegree catalogs), which was then achieved.

Based on a service-oriented framework of modular components, GI-cat can effectively be customized and tailored to support different deployment scenarios.

In addition to the distribution functionality an harvesting approach has been lately experimented, allowing the user to switch between a distributed and a local search giving thus more possibilities to support different deployment scenarios.

A configurator tool is available in order to enable an effective high level configuration of the broker service.

A specific geobrowser was also naturally developed, for demonstrating the advanced GI-cat functionalities. This client, called GI-go, is an example of the possible applications which may be built on top of the GI-cat broker component.

GI-go allows discovering and browsing of the available datasets, retrieving and evaluating their description and performing distributed queries according to any combination of the following criteria: geographic area, temporal interval, topic of interest (free-text and/or keyword selection are allowed) and data source (i.e. where, when, what, who).

The results set of a query (e.g. datasets metadata) are then displayed in an incremental way leveraging the asynchronous interactions approach implemented by GI-cat. This feature allows the user to access the intermediate query results. Query interruption and feedback features are also provided to the user.
Alternatively, user may perform a browsing task by selecting a catalog resource from the current configuration

and navigate through its aggregated and/or leaf datasets.

In both cases datasets metadata, expressed according to ISO 19139 (and also Dublin Core and ebRIM if available), are displayed for download, along with a resource portrayal and actual data access (when this is meaningful and possible).

The GI-cat distributed catalog service has been successfully deployed and experimented in the framework of different projects and initiative, including the SeaDataNet FP6 project, GEOSS IP3 (Interoperability Process Pilot Project), GEOSS AIP-2 (Architectural Implementation Project – Phase 2), FP7 GENESI-DR, CNR GIIDA, FP7 EUROGEOSS and ESA HMA project.