MarineTLO-based warehouse Demo Guide

This guide will help you exploit the functionalities of the software that has been developed by FORTH-ICS in the context of the EU iMarine project. Since many of the artifacts are hosted in the iMarine infrastructure we will also provide some details about how to enter the portal and how to register to particular VREs. The structure of this guide is the following: at first we will describe how a user can login in the iMarine portal and how to register in particular VREs. In the sequel we will describe how users can access the contents of the MarineTLO-based warehouse and browse over its contents.

Accessing the iMarine portal

To expose the functionalities of the gCube system to the end users, a presentation layer has been implemented. This layer adopts the portal/portlets paradigm and it is based on the Liferay portal. The portal is accessible at https://i-marine.d4science.org/. The homepage of the portal is the following (Figure 1).

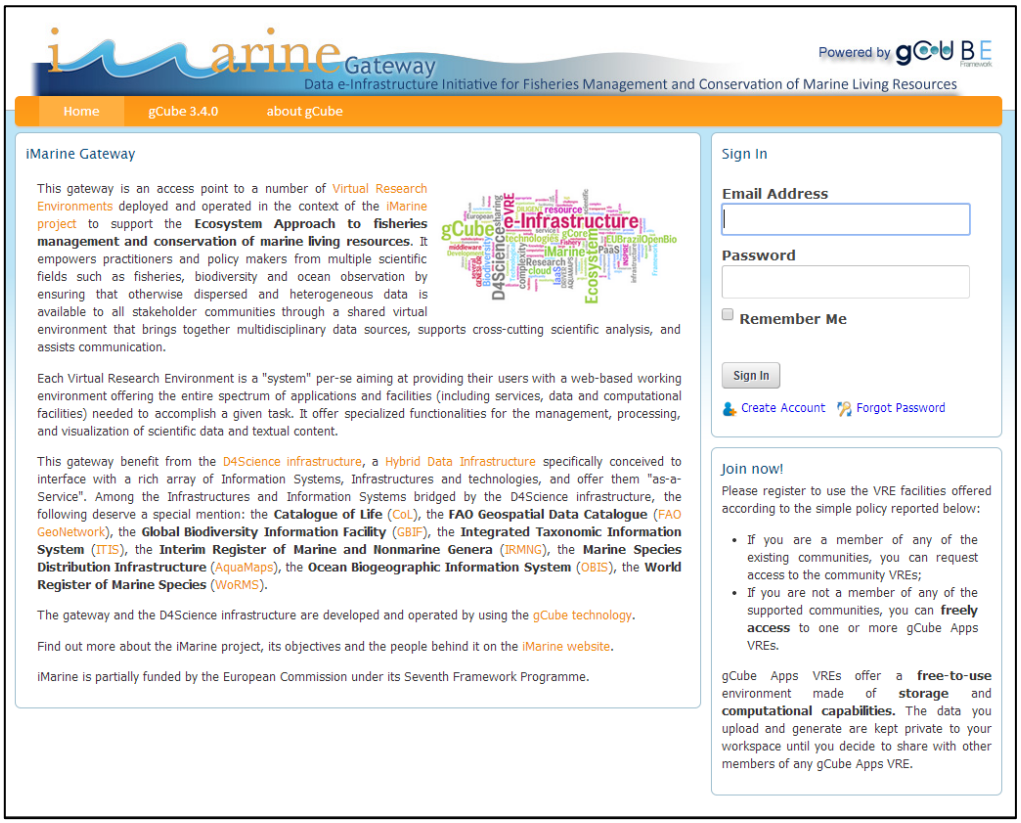


Figure 1: The homepage of the iMarine portal

If you haven't already registered in the portal then click on "Create Account" to sign up. Make sure that you enter a valid email address, because a verification email will be sent, and

this email is going to be used as your username. After creating (and verifying your email) you will see the following screen.

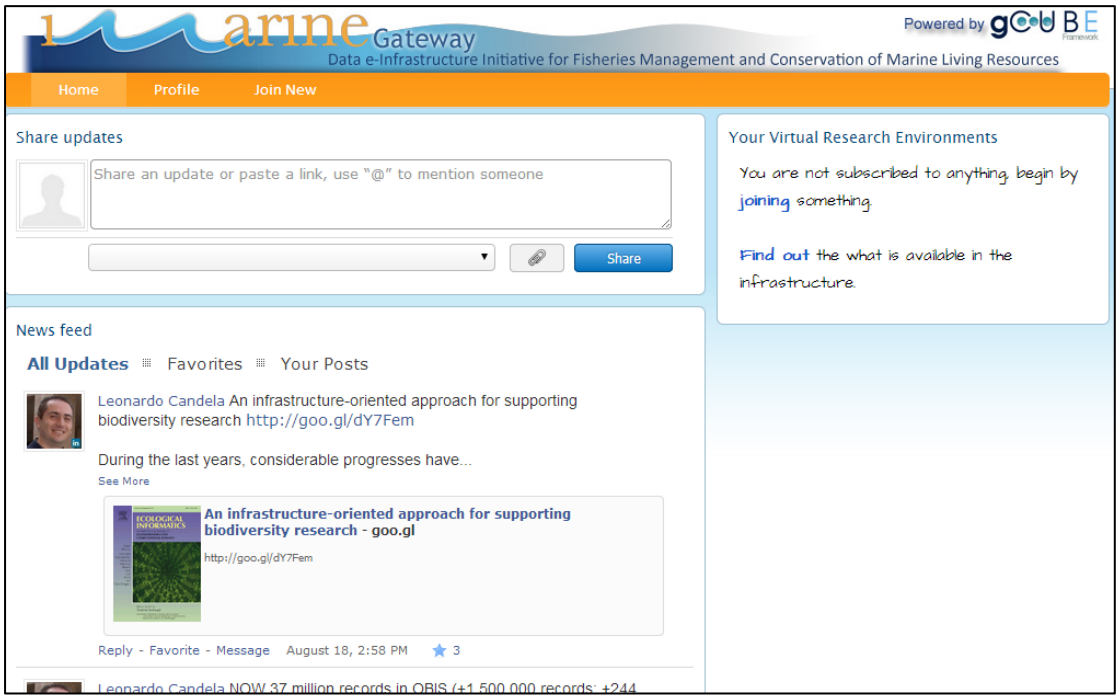


Figure 2: The homepage of iMarine portal

The facilities of iMarine infrastructure are offered through VREs (Virtual Reseach Environments). Practically this means that you should join a VRE first. As you will notice from Figure 2 (in the upper right) you haven't been subscribed to any VREs yet. By clicking on "Find out" you can see the available VREs (Figure 3).

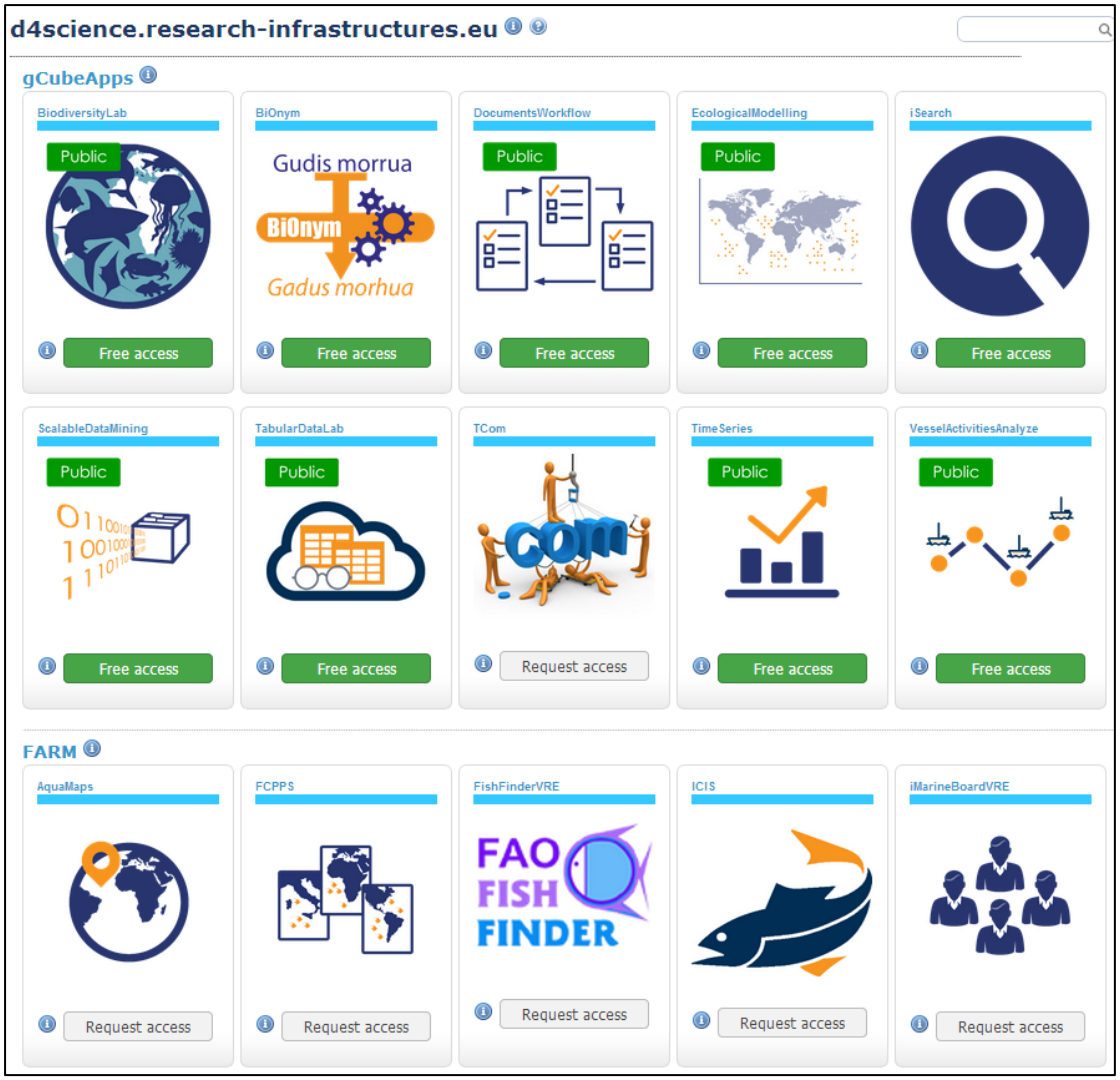


Figure 3: Exploring VREs

You will notice that some VREs have free access (e.g BioDiversityLab, BiOnym, etc.) while for others you have to submit a request for joining (e.g. AquaMaps, FCPPS, etc.). In the sequel whenever it is requested to join a VRE we will also report the VRE that should be used.

MarineTLO-Based warehouse

Accessing the SPARQL endpoint

The SPARQL endpoint of MarineTLO-based warehouse is accessible from iMarine portal using the following VREs:

- BiodiversityLab
- MarineSearch
- iSearch

In the sequel we are going to use the BiodiversityLab VRE to access the MarineTLO-based warehouse SPARQL endpoint. Note that in other VREs the process might be slightly different.

After joining the Biodiversity lab VRE click on the page "*SPARQL Endpoint*". The following figure will show up.

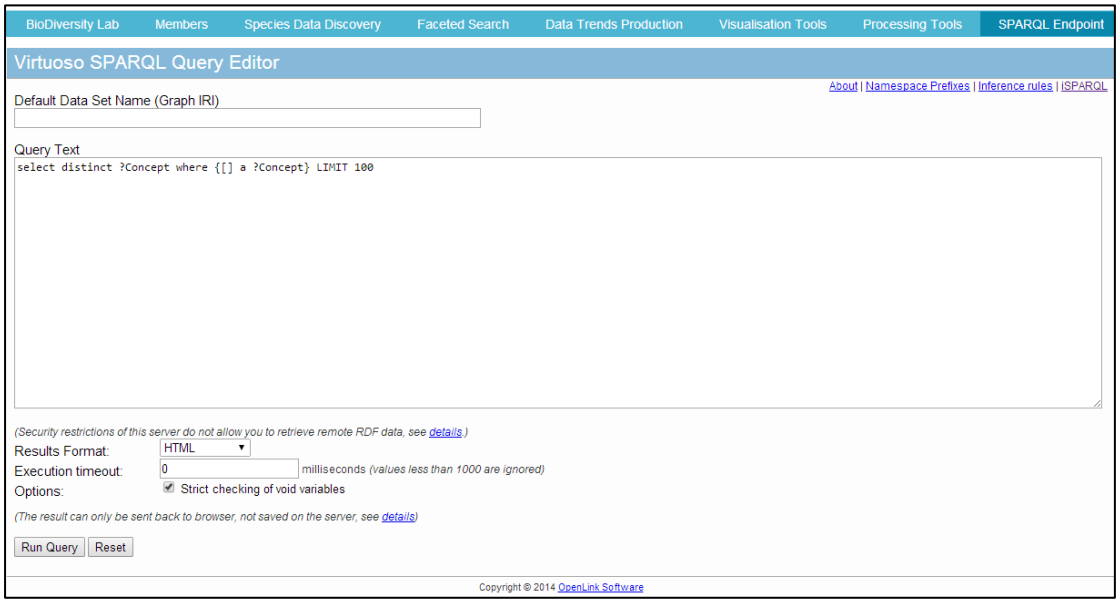


Figure 4: The MarineTLO-based warehouse SPARQL endpoint

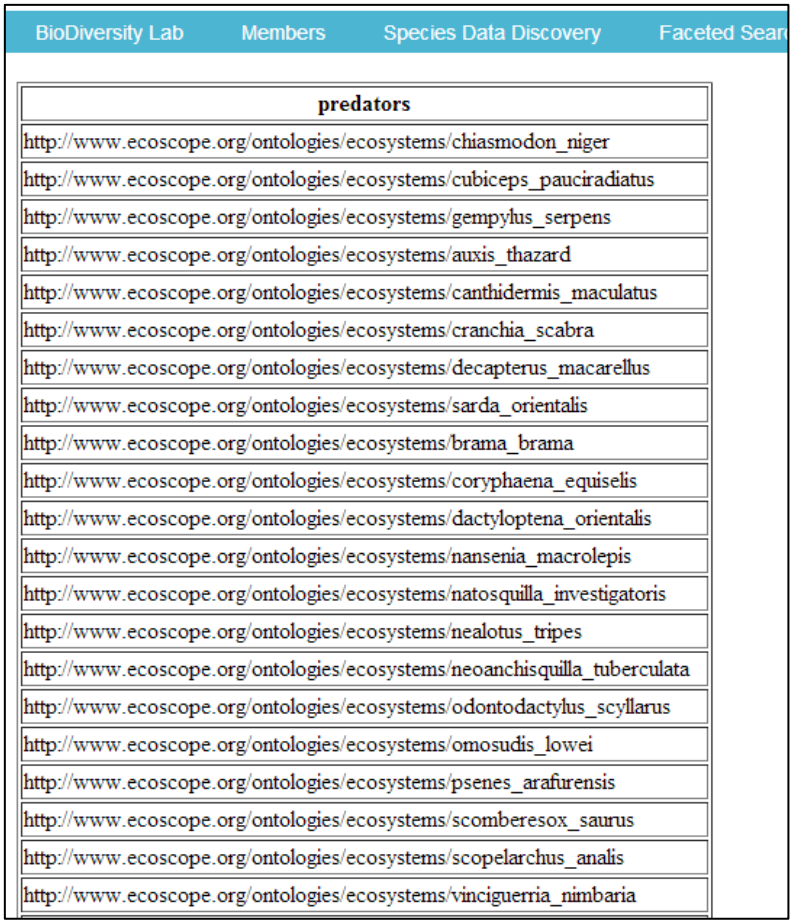
There you can submit your SPARQL queries, and define the format of the results. For building the warehouse we have used OpenLink virtuoso. Virtuoso supports an extended syntax for SPARQL queries, allowing users to define if they want to include also the inferred triples for the evaluation of their query. These instructions are the following:

- `define input:same-as "yes"`: This instruction enables the inference of all triples containing the predicate owl:sameAs (e.g. http://www.ecoscope.org/ontologies/ecosystems/thunnus_albacares> owl:sameAs <http://www.marinespecies.org/entity#WoRMS:127027/Thunnus_albacares>)
- `define input:inference 'http://graphspace'`: This instruction allows inferring triples that have not been physically stored. It recognizes rdfs:subClassOf, rdfs:subPropertyOf, owl:equivalentClass, and owl:equivalentProperty. For this reason we have created a rule-set based on the MarineTLO and its mappings.

The following figure searches for the predators of thunnus_albacares. The results of the SPARQL query are shown in Figure 5.

```
define input:inference 'http://www.ics.forth.gr/isl/Schema'
define input:same-as 'yes'
prefix tloCore: <http://www.ics.forth.gr/isl/MarineTLO/v4/marinetlo.owl#>
SELECT DISTINCT ?predators WHERE{
  <http://www.ecoscope.org/ontologies/ecosystems/thunnus_albacares>
```

```
    tloCore:LT5_usually_is_predator_of ?predators .
}
```



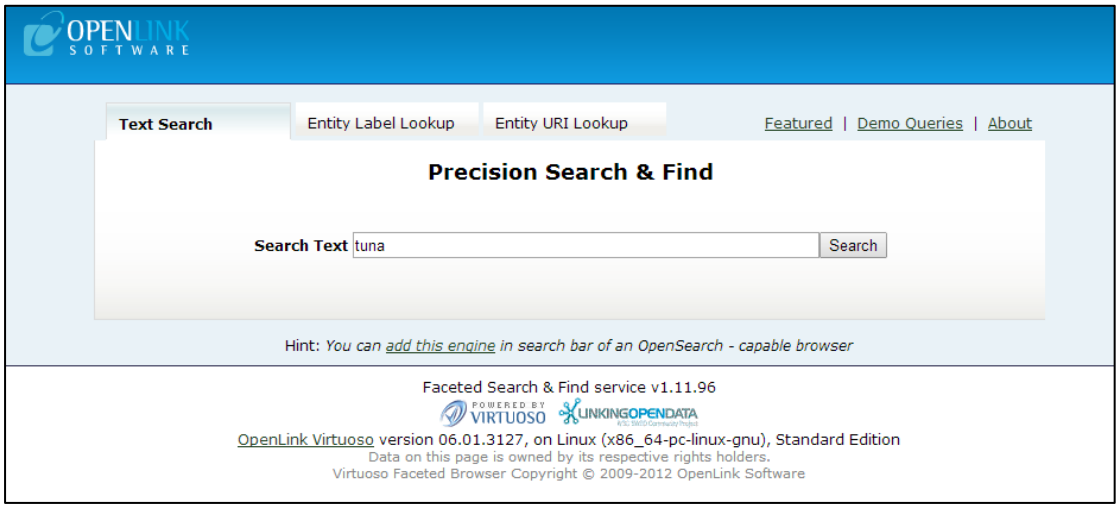
BioDiversity Lab | Members | Species Data Discovery | Faceted Sear

predators
http://www.ecoscope.org/ontologies/ecosystems/chiasmodon_niger
http://www.ecoscope.org/ontologies/ecosystems/cubiceps_pauciradiatus
http://www.ecoscope.org/ontologies/ecosystems/gempylus_serpens
http://www.ecoscope.org/ontologies/ecosystems/auxis_thazard
http://www.ecoscope.org/ontologies/ecosystems/canthidermis_maculatus
http://www.ecoscope.org/ontologies/ecosystems/cranchia_scabra
http://www.ecoscope.org/ontologies/ecosystems/decapterus_macarellus
http://www.ecoscope.org/ontologies/ecosystems/sarda_orientalis
http://www.ecoscope.org/ontologies/ecosystems/brama_brama
http://www.ecoscope.org/ontologies/ecosystems/coryphaena_equiselis
http://www.ecoscope.org/ontologies/ecosystems/dactyloptena_orientalis
http://www.ecoscope.org/ontologies/ecosystems/nansenia_macrolepis
http://www.ecoscope.org/ontologies/ecosystems/natosquilla_investigatoris
http://www.ecoscope.org/ontologies/ecosystems/nealotus_tripes
http://www.ecoscope.org/ontologies/ecosystems/neoanchisquilla_tuberculata
http://www.ecoscope.org/ontologies/ecosystems/odontodactylus_scyllarus
http://www.ecoscope.org/ontologies/ecosystems/omosudis_lowei
http://www.ecoscope.org/ontologies/ecosystems/psenes_arafurensis
http://www.ecoscope.org/ontologies/ecosystems/scomberesox_saurus
http://www.ecoscope.org/ontologies/ecosystems/scopelarchus_analis
http://www.ecoscope.org/ontologies/ecosystems/vinciguerria_nimbaria

Figure 5: SPARQL results

Browsing the contents of MarineTLO-based warehouse

Apart from the SPARQL endpoint, the contents of the MarineTLO-based warehouse, are available through the faceted browser (for short FCT). It is available at http://virtuoso.i-marine.d4science.org:8890/fct/. Figure 6 shows the initial screen of FCT.



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Precision Search & Find

Search Text tuna Search

Hint: *You can add this engine in search bar of an OpenSearch - capable browser*

Faceted Search & Find service v1.11.96

POWERED BY VIRTUOSO LINKINGOPENDATA

OpenLink Virtuoso version 06.01.3127, on Linux (x86_64-pc-linux-gnu), Standard Edition

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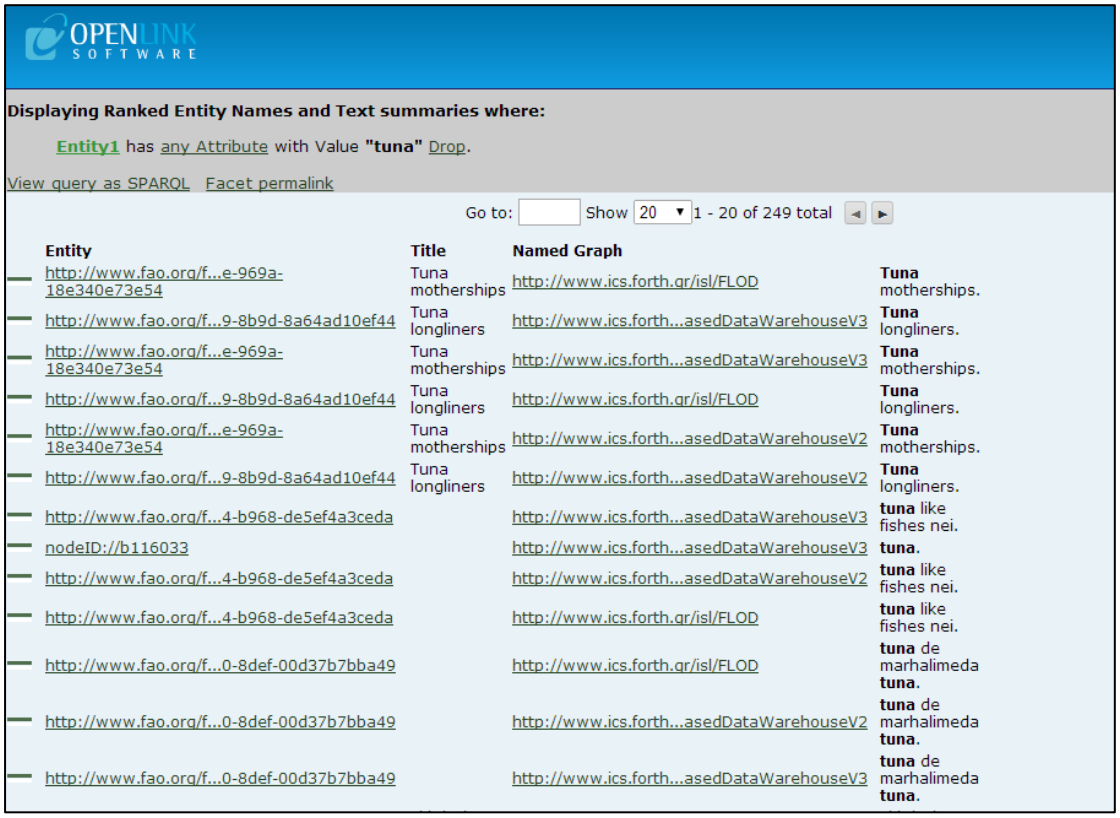
Virtuoso Faceted Browser Copyright © 2009-2012 OpenLink Software

Figure 6: The Faceted Search and Find Service

FCT allows searching for triples by entering query terms (it does not require SPARQL syntax). In this example we used the query tuna. The results are shown in Figure 7. The user can start browsing over the returned triples by clicking on them.



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Displaying Ranked Entity Names and Text summaries where:

Entity1 has any Attribute with Value **"tuna"** Drop.

View query as SPARQL Facet permalink

Go to: Show 20 1 - 20 of 249 total

Entity	Title	Named Graph	
http://www.fao.org/f...e-969a-18e340e73e54	Tuna motherships	http://www.ics.forth.gr/isl/FLOD	**Tuna** motherships.
http://www.fao.org/f...9-8b9d-8a64ad10ef44	Tuna longliners	http://www.ics.forth...asedDataWarehouseV3	**Tuna** longliners.
http://www.fao.org/f...e-969a-18e340e73e54	Tuna motherships	http://www.ics.forth...asedDataWarehouseV3	**Tuna** motherships.
http://www.fao.org/f...9-8b9d-8a64ad10ef44	Tuna longliners	http://www.ics.forth.gr/isl/FLOD	**Tuna** longliners.
http://www.fao.org/f...e-969a-18e340e73e54	Tuna motherships	http://www.ics.forth...asedDataWarehouseV2	**Tuna** motherships.
http://www.fao.org/f...9-8b9d-8a64ad10ef44	Tuna longliners	http://www.ics.forth...asedDataWarehouseV2	**Tuna** longliners.
http://www.fao.org/f...4-b968-de5ef4a3ceda		http://www.ics.forth...asedDataWarehouseV3	**tuna** like fishes nei.
nodeID://b116033		http://www.ics.forth...asedDataWarehouseV3	**tuna**.
http://www.fao.org/f...4-b968-de5ef4a3ceda		http://www.ics.forth...asedDataWarehouseV2	**tuna** like fishes nei.
http://www.fao.org/f...4-b968-de5ef4a3ceda		http://www.ics.forth.gr/isl/FLOD	**tuna** like fishes nei.
http://www.fao.org/f...0-8def-00d37b7bba49		http://www.ics.forth.gr/isl/FLOD	**tuna** de marhalimeda **tuna**.
http://www.fao.org/f...0-8def-00d37b7bba49		http://www.ics.forth...asedDataWarehouseV2	**tuna** de marhalimeda **tuna**.
http://www.fao.org/f...0-8def-00d37b7bba49		http://www.ics.forth...asedDataWarehouseV3	**tuna** de marhalimeda **tuna**.

Figure 7: Results of FCT for query term "tuna"

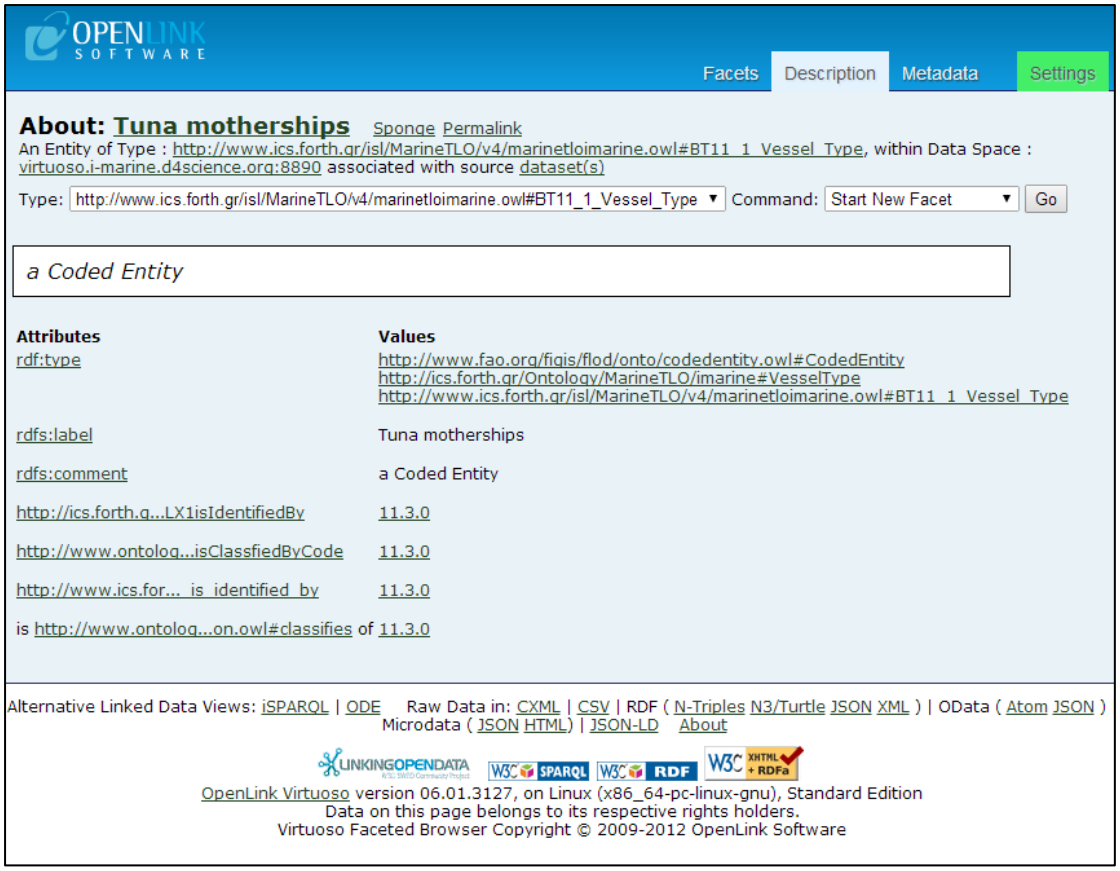


Figure 8: Browsing over the results of FCT

FCT also contains a set of sample queries (the majority of them has been derived from the competence queries that have been used for evaluating MarineTLO). The sample queries can be found by selecting “Demo queries” in the upper right part of the homepage of FCT (Figure 6).

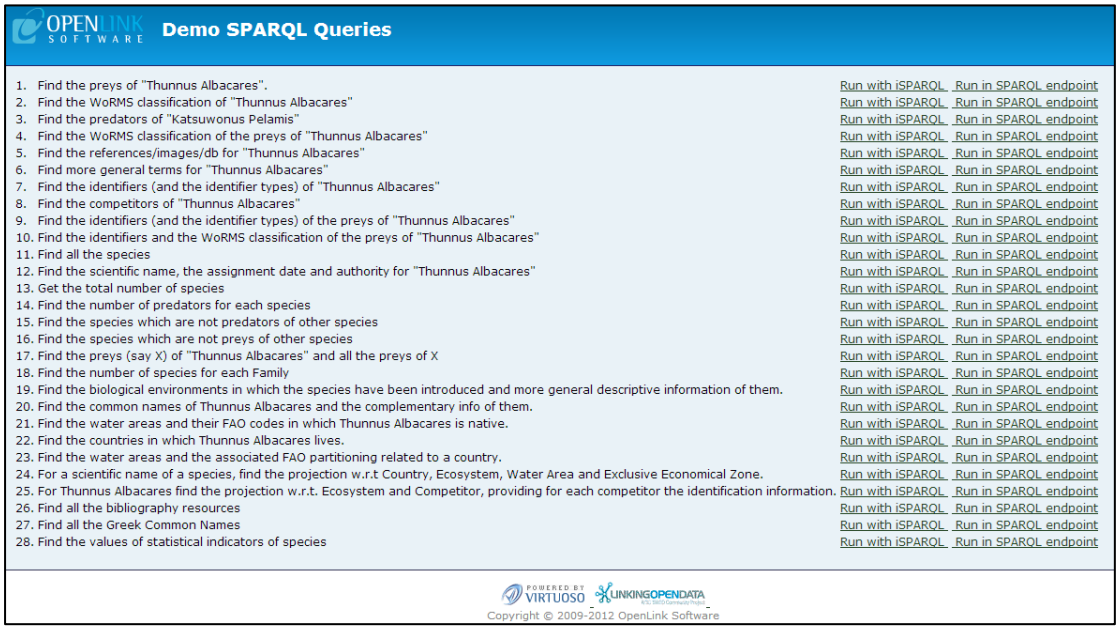
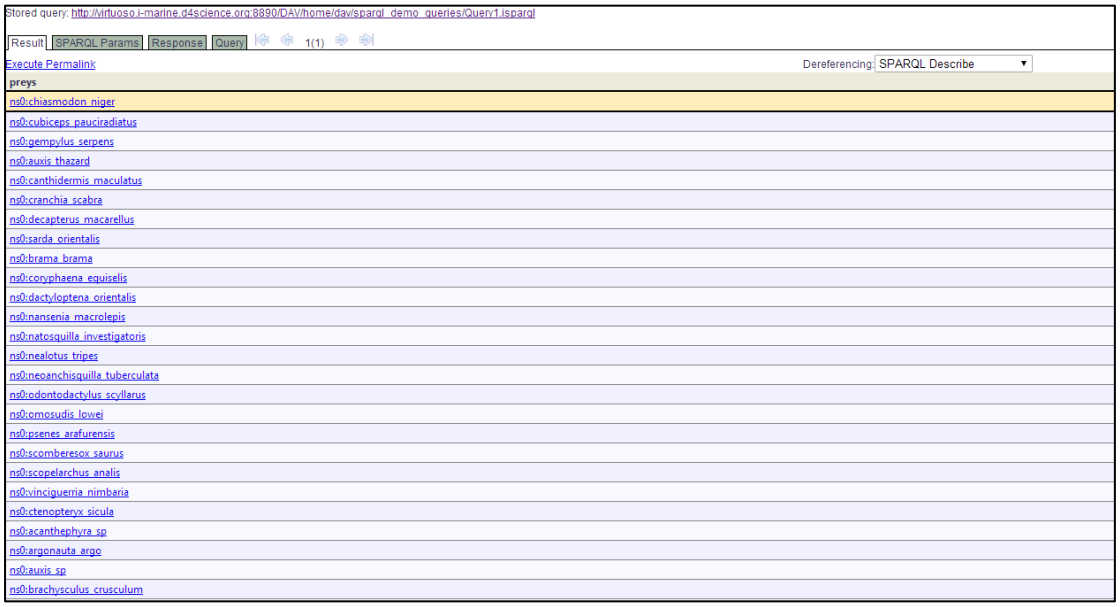


Figure 9: Demo queries

Each query can be executed by selecting Run with iSPARQL. Shows the results from the execution of the 1st demo query.


Stored query: http://virtuoso.i-marine.d4science.org:8890/DAV/home/dav/sparql_demo_queries/Query1.isparql

Result | SPARQL Params | Response | Query | 1(1)

Execute Permalink — Dereferencing: SPARQL Describe

preys
ns0:chiasmodon_niger
ns0:cubiceps_pauciradiatus
ns0:gempylus_serpens
ns0:auxis_thazard
ns0:canthidermis_maculatus
ns0:cranchia_scabra
ns0:decapterus_macarellus
ns0:sarda_orientalis
ns0:brama_brama
ns0:coryphaena_equiselis
ns0:dactyloptena_orientalis
ns0:nansenia_macrolepis
ns0:natosquilla_investigatoris
ns0:nealotus_tripes
ns0:neoanchisquilla_tuberculata
ns0:odontodactylus_scyllarus
ns0:omosudis_lowei
ns0:psenes_arafurensis
ns0:scomberesox_saurus
ns0:scopelarchus_analis
ns0:vinciguerria_nimbaria
ns0:ctenopteryx_sicula
ns0:acanthephyra_sp
ns0:argonauta_argo
ns0:auxis_sp
ns0:brachysculus_crusculum

Figure 10: Results of the 1st demo query

References

[1]. http://wiki.i-marine.eu/index.php/Top_Level_Ontology

[2]. http://wiki.i-marine.eu/index.php/MarineTLO-based_warehouse

[3]. http://virtuoso.i-marine.d4science.org:8890/fct/