

## OpenModeller/COMPs on top of the BioVel portal

Daniele Lezzi (Barcelona Supercomputing Center)

### *Abstract*

**Printable summary:** This demo shows the results of the collaboration between EU-BrazilOpenBio and BioVeL projects in order to provide biodiversity community with a computational cloud infrastructure able to efficiently process Ecological Niche Modelling (ENM) workflows characterized by intensive computing requirements. The cloud-enabled ENM Service developed in EU-BrazilOpenBio, allows the execution of ENM workflows through the EU-BrazilOpenBio Gateway and through the Workflow Management System available in the BioVeL project. A new application, developed as part of EU-BrazilOpenBio, allows scientists to carry out complex experiments leveraging the openModeller environment and generating models for a large number of species, using complex modelling strategies and involving several algorithms and high-resolution environmental data. The application exploits the interoperability features of the COMPSs middleware aggregating computational resources available to the projects through the EGI Cloud Federation. The recently started EUBrazil Cloud Connect project will adopt the ENM service and enhance it with new requirements of the related use cases.

**Description of content:** The demo describes how BioVeL has been provided with a cloud enabled openModeller endpoint through the EUBrazilOpenBio ENM service that implements the openModeller Web Service interface (OMWS2). Both approaches are demonstrated on how the ENM service is used to execute different openModeller experiments; in EUBrazilOpenBio multi-staging and multiparametric experiments are implemented through COMPSs and the openModeller software and managed through a Virtual Research Environment (VRE) portal.

On the other case in BioVeL, thanks to the backwards compatibility of OMWS extensions, the Taverna Workflow Management System is used to execute individual operations to openModeller service.

An Experiment Orchestrator Service, acts as dispatcher of user's requests towards different infrastructures. In the case of the EGI Federated Cloud, the VENUS-C middleware is used to instantiate openModeller workflows on cloud resources. In this case, as illustrated in the demo, the COMPSs Workflow Orchestrator, deployed as a service on one EGI provider, receives the requests and takes care of the execution of the openModeller pipelines on dynamically created virtual machines.

An rOCCI connector is used for the VMs management while data management supports CDMI endpoints.

### **Relevant URL (if any):**

- COMPs: <http://compss.bsc.es>
- EUBrazilOpenBio portal: <http://portal.eubrazilopenbio.d4science.org/>