

## Invocation of Grid Operations in the ViroLab Virtual Laboratory

<http://virolab.cyfronet.pl>

### Motivation

- Grid environment provides
  - Computational power
  - Rich functionality of deployed software
- Challenges:
  - Various programming models
  - Heterogeneous middleware
- Objective:
  - To provide a mechanism for accessing the Grid environment in a uniform and transparent way

### Solution

- Modern scripting language that allows accessing computational resources on a high level of abstraction
- Enable multiple levels of abstraction over Grid (hide complexity but allow full control if needed)
- Provide uniform API for accessing Grid Objects
- Implement a customizable and easily extendable tool

### Implementation

- Grid Operation Invoker is a library for accessing Grid resources in a uniform manner from JRuby script
- Modular architecture to facilitate customization and adding support for new technologies
- Already supports Web Services, LCG jobs (EGEE) and MOCCA components

### JRuby scripting language

- Require necessary class
 

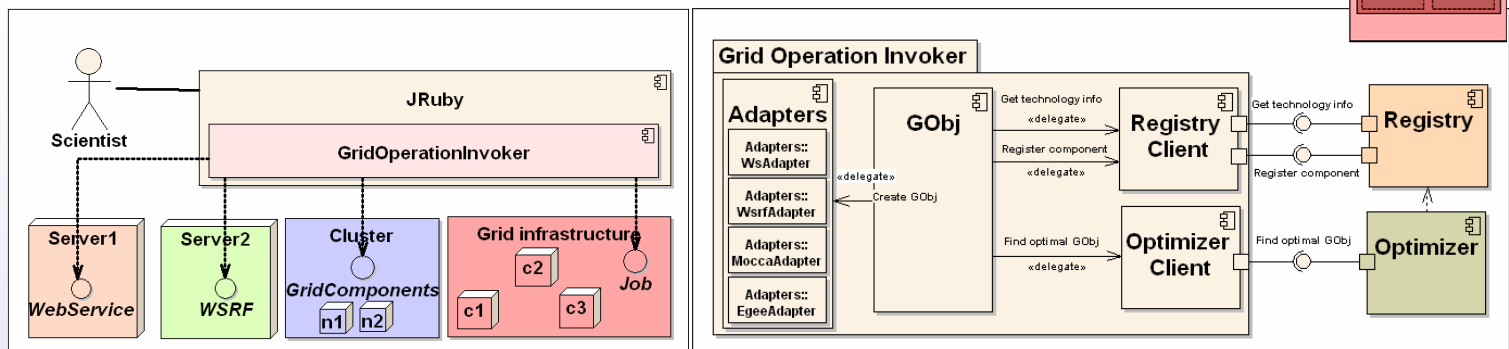
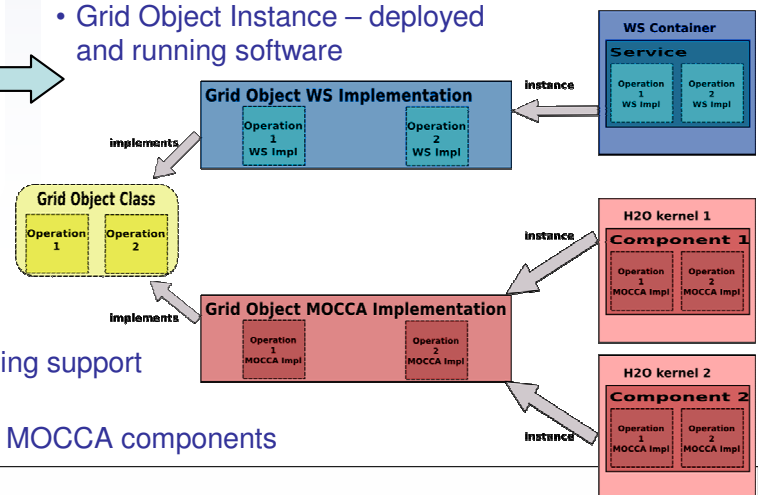
```
require 'cyfronet/gridspace/goi/core/g_obj'
```
- Create Grid Object Instance representative
 

```
classifier = GObj.create('virolab.weka.OneRule')
```
- Use the representative as an ordinary Ruby object
 

```
classifier.train(trainingDataSet)
```

### Abstraction over the Grid environment

- Grid Object Class – declares a set of operations
- Grid Object Implementation – subset of Grid Object Class published in a specific technology
- Grid Object Instance – deployed and running software



### Summary and future work

- Prototype demonstrates the interoperability among Grid middleware technologies
- Support for additional technologies: WSRF, AHE and Unicore middleware suites.

### Authors

Tomasz Bartyński (2), Marian Bubak (1,2), Maciej Malawski (1,2)

(1) Institute of Computer Science AGH, al. Mickiewicza 30, 30-059 Kraków, Poland

(2) ACC CYFRONET AGH, ul. Nawojki 11, 30-950 Kraków, Poland

### References

Tomasz Bartyński, Marian Bubak, Tomasz Gubała, Maciej Malawski: *Universal Grid Client: Grid Operation Invoker*; Proceedings of International Conference of Parallel Processing and Applied Mathematics (PPAM'07), Gdansk, September 2007, LNCS (to appear).