

Expo : an experiment framework for dedicated platforms

Tuesday, February 12, 2008 11:30 AM (20 minutes)

Expo is used to analyze the performances of the file broadcasting tool Kastafor. Kastafor broadcasts a single file onto a given set of nodes. The aim of this experiment is to study Kastafor's performances across Grid'5000 when the file size and the number of nodes vary.

The script used to conduct the experiment is only 15 lines long. Expo interprets this script and issues reservation commands. When the described resources are obtained they are checked to verify that they suit the experiment.

Once used resources are determined, each measurement is launched by a command module. This module archives every outputs produced for future analysis. It also records the status of commands and thus monitors the proper unrolling of the experiment.

When all measurements are done, resources are freed and a complete report on the experiment can be stored on disk.

In the end the experimenter just has to analyze the results.

3. Impact

Expo can be compared to other experiment framework like PluSH or ZENTURIO. There are many differences between Expo and those frameworks.

For instance they are tied to a certain architecture. PluSH is tied to PlanetLab and ZENTURIO to Globus Grids, while Expo is not aimed at an architecture. Instead it uses a driver framework to manage resources.

The type of experiments conducted on Grid'5000 is also not the same than those of PlanetLab and Globus grids. PlanetLab experiments are network oriented, and thus PluSH design takes this into account. ZENTURIO aims at testing applications that are to be deployed on Globus grids, while Grid'5000 experiments are more middleware oriented.

And last but not least the languages used by those frameworks are rather complex, PluSH uses XML description while ZENTURIO is based on an imperative and very complete language. The domain specific language designed for Expo is derived from ruby and is very concise and powerful.

URL for further information:

<http://expo.imag.fr/>

4. Conclusions / Future plans

The Expo framework enabled the design and the conduct of a complex experiment. Nonetheless the description of resources in a broad meaning is problematic. In order to manage transparently resources from Grid'5000 and PlanetLab the concept of resources has to be developed further. Resources have a number of properties like gateways, hardware configuration and software configuration that have to be accounted for when running an experiment.

Provide a set of generic keywords that define your contribution (e.g. Data Management, Workflows, High Energy Physics)

Workflows, Experiment Methodology

1. Short overview

Expo is a framework to conduct and control experiments on platforms dedicated to experimentation like Grid'5000. It's primary goal is to help experimenter make reproducible experiments.

Experiments are described through program written with a domain specific language (DSL). This language simplifies the development of complex experiments.

This framework can be use on Grid'5000 platform, PlanetLab, DSLLab and will be extent to be used with Emulab and SensLab the future wireless sensor testbed.

Primary authors: Mr VIDEAU, Brice (INRIA / LIG); Dr RICHARD, Olivier (INRIA / LIG)

Presenters: Mr VIDEAU, Brice (INRIA / LIG); Dr RICHARD, Olivier (INRIA / LIG)

Session Classification: From research to production grids: interaction with the Grid'5000 initiative

Track Classification: Existing or Prospective Grid Services