

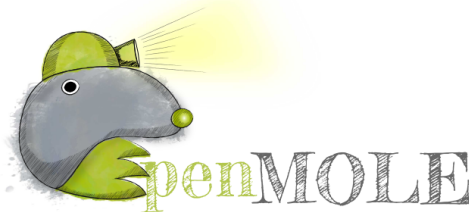
OpenMOLE

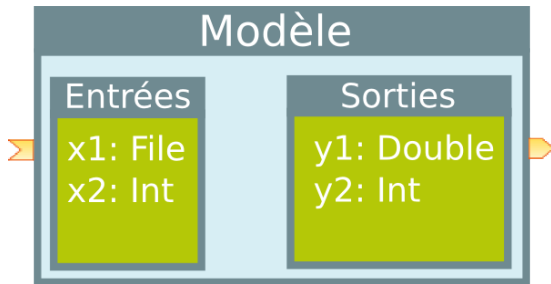
Et l'étude de vos modèles de simulation ne connaîtra plus de limites

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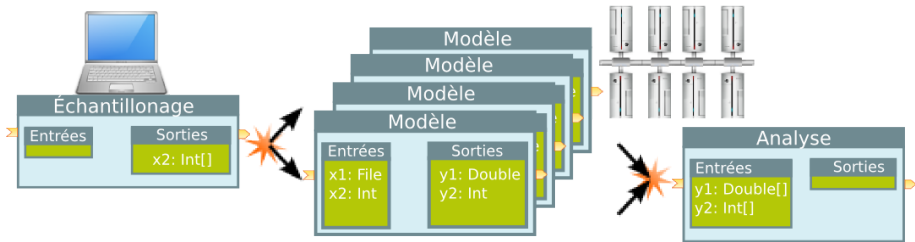
Réseau pour le développement et le calcul à Clermont
21 Mai 2012





- Un système complexe à étudier
- Un (ou plusieurs) modèles à étudier
- Des variables et des fichiers en entrée et en sortie
- Le reste importe peu

Là où les ennuis commencent ...



Comment intégrer les différentes briques ?

- La (ou les) plate-forme(s) des modèles étudiés
- Les méthodes d'échantillonnage et d'analyse
- Le middleware pour les ressources de calcul distribuées

... et où OpenMOLE entre en scène

The screenshot displays the OpenMOLE software interface. At the top, the window title is "OpenMOLE - /home/dumoulin/test.xml". Below the title bar is a menu bar with "File" and "Tools". A toolbar contains buttons for "Prototype", "Task", "Sampling", and "Environment". A tab labeled "Ma Mole" is active. Below the toolbar are icons for a wrench, a curved arrow, a gear, and a pill. The main workspace is divided into two panels. The left panel shows a workflow diagram with three nodes: "exploration", "modèle", and "analyse". Each node contains a circular diagram with numbers and arrows. The "exploration" node is highlighted with a red box and a delete icon. The right panel shows a configuration window for a task named "complet". It includes a "delete" button, a "Factors" section with two factors "i" and "j", and their respective ranges and steps. The "i" factor is defined on a "Range" from 10 to 13 with a step of 1. The "j" factor is defined on a "Range" from 2 to 6 with a step of 2. A "+" button is visible at the bottom of the configuration panel. In the bottom left corner, there is a logo for "Nicolas Dumoulin" featuring a mole character and the text "MOLE". In the bottom right corner, there is a "listen" icon and the text "4 / 10".

OpenMOLE - /home/dumoulin/test.xml

File Tools

▼ Prototype ▼ Task ▼ Sampling ▼ Environment

Ma Mole ✕

exploration ✕
delete
Sampling complet 👁

exploration modèle analyse

complet ✕
delete

Factors

i defined on Range
Min 10 Max 13 Step 1

j defined on Range
Min 2 Max 6 Step 2

+

Nicolas Dumoulin MOLE

listen 4 / 10

Les concepts : tâches et transitions

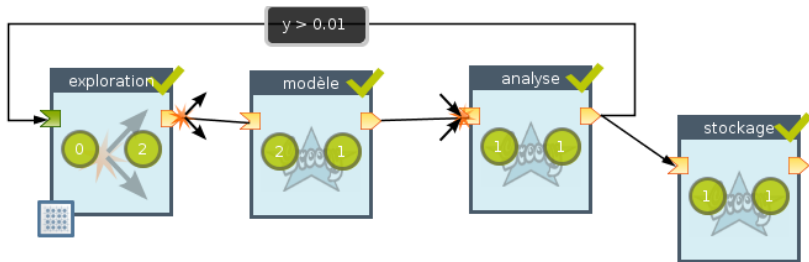
The screenshot displays the OpenMOLE software interface. At the top, the window title is "OpenMOLE - /home/dumoulin/test.xml". Below the title bar is a menu bar with "File" and "Tools". A toolbar contains dropdown menus for "Prototype", "Task", "Sampling", and "Environment". A tab labeled "Ma Mole" is active. Below the toolbar are four icons: a wrench and screwdriver, a curved arrow, a location pin, and a red pill.

The main workspace is divided into two panels. The left panel shows a task configuration for "exploration". It includes a task icon (a star with arrows), a "delete" button, and a "Sampling" dropdown menu set to "complet". Below this, a workflow diagram shows three tasks: "exploration", "modèle", and "analyse". Each task is represented by a box containing a star icon and two circular nodes with numbers. "exploration" has nodes 0 and 2. "modèle" has nodes 2 and 1. "analyse" has nodes 1 and 0. Arrows indicate dependencies between tasks.

The right panel shows a task configuration for "complet". It includes a task icon (a grid of dots), a "delete" button, and a "Factors" section. The "Factors" section lists two factors, "i" and "j", each defined on a "Range" scale. For factor "i", the Min is 10, Max is 13, and Step is 1. For factor "j", the Min is 2, Max is 6, and Step is 2. A "+" button is visible below the factors.

At the bottom left, there is a logo for "Nicolas Dumoulin" and "MOLE". At the bottom right, the text "OpenMOLE" and a version indicator "5 / 10" are visible.

Les concepts : tâches et transitions



- Les tâches sont conçues pour être portables et extensibles
- Les transitions
 - transfert automatique des variables et des fichiers
 - exécution parallèle et point de synchronisation naturels
 - transition conditionnel pour les traitements itératifs
 - transitions d'exploration et de rassemblement pour les traitements en masse

Les concepts : tâches et transitions

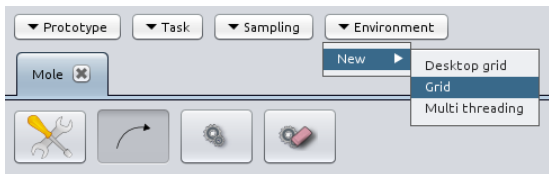
The screenshot displays the OpenMOLE software interface. At the top, the window title is "OpenMOLE - /home/dumoulin/test.xml". Below the title bar is a menu bar with "File" and "Tools". A toolbar contains several icons: a wrench and screwdriver, a curved arrow, a gear, and a red key. Below the toolbar, there are dropdown menus for "Prototype", "Task", "Sampling", and "Environment". A "Ma Mole" button is also present.

The main workspace is divided into two main areas. On the left, a workflow diagram shows three task boxes: "exploration", "modèle", and "analyse". Each box contains a mole icon and some numbers. Arrows indicate the flow from "exploration" to "modèle" and from "modèle" to "analyse". A transition icon (a square with a starburst) is positioned between the "exploration" and "modèle" boxes.

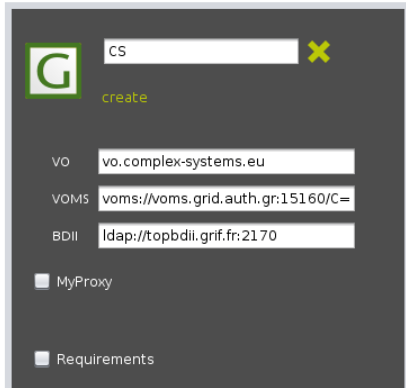
On the right, a configuration panel for the "complet" task is shown. It includes a "delete" button and a "Sampling" dropdown menu set to "complet". Below this, the "Factors" section lists two factors, each with a "defined on" dropdown set to "Range" and input fields for "Min", "Max", and "Step".

At the bottom of the interface, the text "OpenMOLE - 0.5 - Boundless Bamboo" is visible. The OpenMOLE logo, featuring a mole character, is located in the bottom left corner.

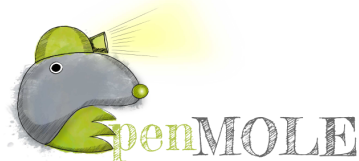
Les concepts : environnements



Une tâche peut être associée à un environnement d'exécution

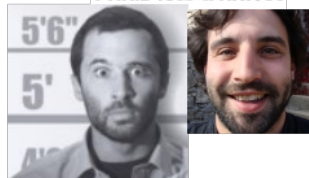


- Grille de calcul
- Nombre de cœurs sur la machine locale
- *Desktop grid*
- SSH
- Bientôt les clusters PBS/Torque/MAUI



- Une dizaine de projets déjà achevés
- Projet initié avec SimExplorer depuis 10 ans
- Premier prototype de la version workflow en 2008
- Premières applications en production en 2009
- GUI publiée en 2011 (0.4)
- 0.5 en cours de publication (RC2 disponible)

OpenMOLE, c'est qui ?



<http://www.openmole.org>

- ISC Paris IdF : Mathieu Leclaire et Romain Reuillon
- Irstea - Lisc : Nicolas Dumoulin et Thierry Faure