gLite on Grid'5000 : towards a real-size testbed for production grids

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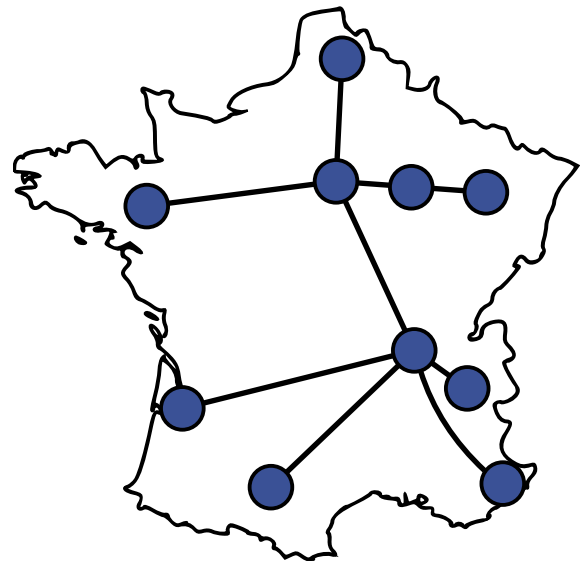
Goal

- **Use Grid'5000 as a testbed for gLite**
- Use cases : developers of gLite components, and of applications interacting with the gLite middleware
  - Be able to **run experiments in a stable environment** (no variation between experiments) $\rightsquigarrow$ compare results
  - Be able to **create experimental conditions required by an experiment**, possibly hard to meet in a production environment (e.g service crash)
  - Be able to **replace components of the infrastructure** $\rightsquigarrow$ test new versions, test interoperability
  - **Avoid overloading or influencing the production infrastructure** with test jobs

Grid'5000

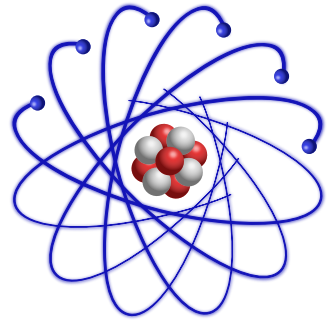
- **Experimental platform for research on distributed systems** and high performance parallel computing
- 1700 nodes (7000 cores), 10 sites in France
- **Reconfigurable by users** : operating system on nodes can be replaced using Kadeploy, network isolation with KaVLAN



Deployed gLite infrastructure

- One **VO** and its **VOMS (*Virtual Organization Membership Service*)**, users directory
- Several sites, composed of :
  1. One **BDII (*Berkeley Database Information Index*)**, directory of resources available on each site
  2. One **CE (*Computing Element*)**, task submission service for a given computing site
  3. **Worker nodes** and a **batch scheduler** to access them. **Torque/Maui** was used
  4. One **UI (*User Interface*)**, used by users to access the resources

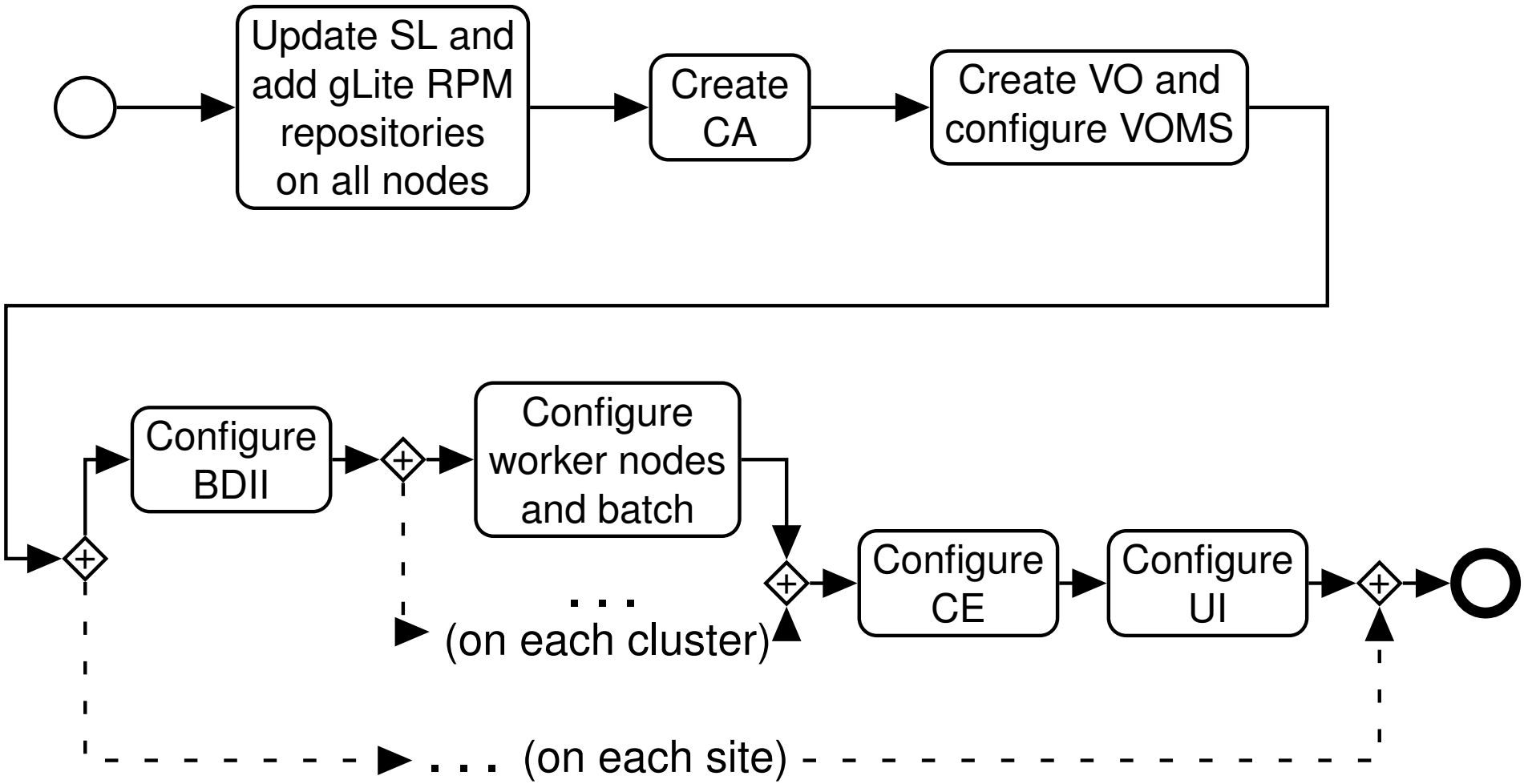
Tools developed



- **Scientific Linux 5.5** image, minimal and generic (working on all Grid'5000 clusters) for the Kadeploy deployment tool
- **Ruby scripts** enabling an automated installation of gLite from RPM repositories
  - Description of the platform to deploy (VO, sites, clusters) in a configuration file
  - Creation of a certification authority to generate and automatically sign users and machines certificates
  - Pre-filling of the RPM cache on nodes using Kadeploy to accelerate deployment

`https://github.com/sbadia/gdeploy/`

Deployment process



Results

Use of Grid'5000 to deploy the gLite middleware

- Deployment up to **926 nodes (17 clusters, 9 sites)**
- Installation of machines with Scientific Linux 5.5 using Kadeploy : 10 minutes
- Configuration of gLite with one VO on 597 nodes (6 sites, 10 clusters) : **170 minutes**

Future work

- **Improvements to the deployment script**
  - Deployment of several VO
  - Deployment of other gLite services : storage, monitoring
- **Collaborations**
  - **Experiments on evolution of gLite components**
  - **Experiments on tools interacting with the gLite middleware : workflow engines, pilot jobs managers, etc.**
    - Simulation of services crash
    - Load injection
    - Submission of a large number of fake tasks