UBIVERTEX - Letter of Intention

Institute/Company

Name: INRIA Country: FRANCE

Activity domain: Computer Science

Number of employees: ☐ <50 ☐ <250 x☐ > 500

Name of the department/research team: CEPAGE

Scientific contact

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Challenge descriptions:

Modelisation of the behavior of these infrastructures (in terms of networking, CPU sharing, contentions, ...), with two goals:

- Enable precise simulations (we have an accepted ANR project around these problematics (SONGS), in collaboration with AlGorille and Ascola, among others)
- Design efficient algorithms for
  - resource allocation (allocation of VMs to physical machines),
  - data management (data placement in order to optimize load balancing and access times). This can be seen as the capacitated K-center problem
- Focusing on the following:
  - Robustness: the allocations produced should remain efficient (and valid with respect to QoS constraints) in the presence of dynamicity (changing VMs requirements)
  - Scalability: the algorithms should scale up to a large number of machines, which implies that at least the most critical parts should be implemented in a distributed way
  - On-line: the algorithms should gracefully react to new VMs entering and/or leaving the system, and the reconfiguration cost to reach the new allocation should be controlled

Having an access to a virtualised infrastructure would greatly help by enabling to identify the critical points to optimize, and allowing to compare different solutions in a realistic environment.

Type of commitment (internship, Phd grant, engineering staff):
Postdoc, PhD from the ANR

Number of persons involved in these challenges: 3

Signature of Scientific Contact:	Signature of the Legal Representative:
Date: 9 September 2011	Date: