

# Workshop on Secure, Trusted, Manageable and Controllable Grid Services (SGS 2008)

Grid systems are expected to connect a large number of heterogeneous resources (PCs, databases, HPC clusters, instruments, sensors, visualization tools, etc.), to be used by many users and to execute a large variety of applications (number crunching, data access, multimedia, etc.) and may deal with many scientific fields (health, economy, computing etc.).

Grids are distributed systems and, like them, the notion of security, the way we manage such large system and the way we control the grid system are of particular interest. For instance, the word ‘controllable’ means how we measure the activity of the grid and how we report it. The word ‘manageable’ means how we deploy the grid architecture, the grid softwares, and how we start jobs (under controllable events such as the availability of resources). The word ‘security’ refers to the traditional fields of authentication, fault tolerance but also refers to safe execution (how to certify results, how to adapt computation according to some metric). Moreover, all these services should collaborate, making the building of middleware a challenging problem. In this context questions about who holds the sensitive information, who has permissions to access it, how this information is handled are raised. Therefore, the building of a chain of trust between software components as well as the integration of security and privacy mechanisms across multiple autonomous and/or heterogeneous grid platforms are key challenges.

This workshop aims at gathering papers in the fields of grid/distributed systems and it extends the recent STPG workshop (see CCGRID2008) and the *Journal of Supercomputing* special issue that have served to federate a community of researchers and practitioners. The workshop is also open for contributions in connected fields: P2P systems, sensors networks, networking, large-scale heterogeneous distributed databases.

The Steering Committee invited authors to submit original and unpublished work. We also required that the submission was not being concurrently submitted to another special issue or conference. Papers were reviewed by at least two reviewers. We informed authors that papers without evaluation (either theoretical or experimental) would not be considered.

So, we solicited novel papers on a broad range of topics including but not limited to the following keywords:

- Grid monitoring and controlling (forecasting...) systems
- Grid management systems (deployment of infrastructures and applications)
- Grid security: access control, i.e., authentication, trust-based models
- Infra-structural support for privacy in grid environments: architectures, mechanisms, models, frameworks and implementation
- Specification of grid services for secure components

- Secure execution and reliability: adaptation, results' certification, safe execution and/or communication
- Aggregation of secure/manageable components into grid middlewares
- Algorithms related to resource brokers, load balancing and heterogeneity
- Applications and experiences with secure/manageable/controllable grid infrastructures

Since the selection of papers of the workshop was not a 'one-shot' process, we requested the authors to carefully read the reviews and to modify the original submission (and the oral presentation) as soon as possible in order to take into account the comments... and the work was done! The selected papers were:

- Attila Kertesz, Ivan Rodero and Francesc Guim Bernat. "Meta-Brokering Solutions for Expanding Grid Middleware Limitations"
- Sebastien Varrette, Jean-Louis Roch, Guillaume Duc and Ronan Keryell. "Building Secure Resources to Ensure Safe Computations in Distributed and Potentially Corrupted Environments"
- Caniou Yves and Jean-Sebastien Gay. "Simbatch: An API for Simulating and Predicting the Performance of Parallel Resources Managed by Batch Systems"
- Heithem Abbes and Jean-Christophe Dubacq. "Analysis of Peer-to-Peer Protocols Performance for Establishing a Decentralized Desktop Grid Middleware"
- Oleg Lodygensky, Gilles Fedak, Gabriel Caillat, Haiwu He and Etienne Urbah. "Towards a Security Model to Bridge Internet Desktop Grids and ServiceGrids"

The workshop started on August 25, 2008, at the Informatics and Mathematics Building. The order for presentations followed the list of selected papers above, and talks were 30 minutes long. The slides for presentation are available online at <http://www.lipn.fr/~cerin/SGS.html>. During the last part of the workshop, we managed a panel discussion in order to isolate main topics of interest for the next workshop and what we think is important for future work.

During the panel session, attendees listed the problems covered in the talks and showed the coherency of the topics of selected papers. At the end, they tried to find a common interest and emerging projects for the future.

For the sake of simplicity, the topics covered during the workshop can be summarized as follows:

1. Analysis of publish/subscribe systems in order to build an institutional / community orchestration tool for desktop grids
2. Meta brokering solutions: how to make grid services more generic
3. Techniques for building secure resources and safe computation
4. An API for simulating and predicting scheduling heuristics
5. Security models for coupling Internet desktop grids and service grids: how to cope with different grid instances according to a secure mode

Attendees concluded that they have all the components to build a result certification service for desktop grids, and the building of such a service introduces challenging efforts in order for it to be:

- Scalable
- Decentralized as much as possible
- Based on standards for cooperation and description
- Based on proved algorithms for the certification algorithms
- With performance
- Interoperable with other grids flavors and with a secure mode to grant operations (delegating rights)
- Able to be simulated in order to validate the component

From the certification side, they noticed that a large set of techniques exist, among them replication, partial replication of randomly selected tasks, lists of repudiation to minimize re-computations, and quiz. From the meta-brokering point of view, they noticed that standards are now available for the description scheduling languages, for the capability description languages, for global job identifiers, for security management so that the certification services could be build on top of theses facilities.

Finally, attendees recalled the questions of “what is the best institutional form / organization able to support such work” and how to extend the topics of the workshop for the 2009 edition.

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