

## Action 804

2009 - 2013

### Energy efficiency in large scale distributed systems



Participating countries: AT, CY, DE, DK, ES, FI, FR, GR, HU, IL, IT, LU, PT, PL, RO, UK  
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### Working Group 1

#### State of the art and continuous learning of hardware and adaptation possibilities

This Working Group will gather the participants experiences and knowledge about the possibilities to adapt the underlying infrastructures of the distributed systems in order to decrease its energy consumptions, from an hardware piecemeal perspective: Individual components of the system may be regarded separately.

### Working Group 2

#### Characterization of energy consumption and energy efficiency

This Working Group will find appropriate definitions for energy efficiency and investigate the energy consumption and efficiency for system components to the whole distributed systems (taking into account the potential influence of one part to another). The relationship between resources sharing and energy consumption will be evaluated establishing the corresponding cost models. The Action will introduce a measurable metric to establish adaptive solutions. To this end, the energy consumption must be evaluated precisely. This part is mandatory to be able to compare the different approaches promoted in the Action. This Working Group may raise two Focus Groups on the two sides, energy estimation and energy efficiency characterization.

### Working Group 3

#### Adaptive actions for distributed systems

This Working Group will define some possible actions that can be taken when energy cost is known, at the middleware, network and applications levels. The efficiency of the different actions to be undertaken will be evaluated thanks to the cost models. This Working Group will certainly create several Focus Groups investigating in parallel several approaches at the different levels of a distributed system infrastructure.

### Working Group 4

#### Characterization of performance-energy saving trade-off

Cost model based metric establishes a new scenario with differentiated socio-economic behaviours, resulting a new type of business clusters. Analytical optimisation models and their implementation by corresponding algorithms will be used, supported and verified by simulation models and programs.

### Working Group 5

#### Scientific coordination and dissemination of the works and definition of a common opened framework

The targets of the dissemination tasks are to attract audience of academic and of industrial communities and to integrate diverse audiences and diverse practices. The dissemination means include Web-exposed sites and/or portals, a newsletter, technical and programme reports, research papers, Workshops, advertising, and a final book. Furthermore, this Working Group will support and initiate efforts towards a description of a common opened platform for energy reduction in large scale distributed system which will be related with some pertinent use cases.

### Objectives:

- Increase EU research in the field of energy efficiency in distributed systems.
- Scientific objectives: promote coordination and discussions among individual research groups
- Societal objectives: different audiences targeted to raise energy awareness
- Become a reference point in Europe for energy consumption integration in ICT
- Raising awareness on energy hungry computing
- Raising consciousness of the possibilities of the system to adapt while guaranteeing performances