**CoolEmAll**

Platform for optimizing the design and operation of modular configurable IT infrastructures and facilities with resource-efficient cooling

In many current data centers the actual IT equipment uses only half of the total energy while the remaining part is required for cooling and air movement. This results in poor cooling efficiency and energy efficiency, leading to significant CO₂ emissions. The goal of the CoolEmAll project is to enable designers and operators of next generation data center to reduce its energy impact by combining optimization of IT, cooling and workload management in a holistic and comprehensive way, taking aspects into account that were considered traditionally separately.

The main results of the CoolEmAll project, available on the project website, include [a] data center efficiency building blocks (DEBBs), reflecting an assembly of data center components on different granularity levels and containing models necessary for workload, heat and airflow simulation, and, [b] the simulation, visualization, and decision support toolkit (SVD Toolkit), realized by coupled workload and thermal-airflow simulation, for analysis and optimized design of modular IT infrastructures and facilities with resource-efficient cooling. Both DEBBs and the SVD Toolkit take into account four aspects that have major impact on actual energy consumption: hardware characteristics, cooling models, application properties, and workload and resource management policies.

HLRS is responsible for technical project management and development of the SVD Toolkit. HLRS computer scientists are working as a part of the consortium on simulating computing resources and facilities, enabling identification of hotspots, and remediating energy waste by optimizing design and cooling in data centers. By using interactive simulation and visualization, staff at various data centers can evaluate impact of different cooling methods and computer room layouts on energy and cooling efficiency, and make informed decisions on their optimization.

The project consortium consists of simulation-, modeling- and Green IT experts from all over Europe:

- Poznan Supercomputing and Networking Center, PL
- High Performance Computing Center Stuttgart (HLRS), D
- Institute for Research in Informatics of Toulouse, F
- Christmann Informationstechnik + Medien GmbH & Co. KG, D
- The 451 Research LTD, UK
- Institut de Rercerca en Energia de Catalunya, E
- Atos Origin, E

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Project Website: [http://www.coolemall.eu](http://www.coolemall.eu)

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