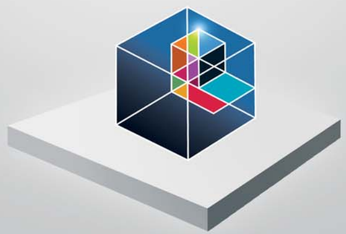
Participant organisation name	Short name	Country
Greek Research & Technology Network	GRNET	GR
Institute of Information and Communication Technologies Bulgarian Academy of Sciences	IICT-BAS	BG
"Horia Hulubei" National Institute of Research & Development for Physics and Nuclear Engineering	IFIN-HH	RO
The Scientific & Technological Research Council of Turkey	TUBITAK ULAKBIM	TR
National Information Infrastructure Development Office	NIIF	HU
Institute of Physics Belgrade	IPB	RS
Polytechnic University of Tirana	PuoT	AL
University of Banja Luka	UoBL ETF	BA
SS. Cyril & Methodius University of Skopje	UKIM	MK
University of Montenegro	UOM	ME
Research & Educational Networking Association of Moldova	RENAM	MD
Institute for Informatics & Automation Problems, National Academy of Sciences of Armenia	IIAP-NAS-RA	AM
Georgian Research & Educational Networking Association	GRENA	GE
Azerbaijan Research and Education Association	AZRENA	AZ



HP-SEE receives EC support through FP7 under the "Research Infrastructures" action

European Commission
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HP-SEE
High-Performance Computing Infrastructure for South East Europe's Research Communities

Project acronym: HP-SEE

Contract n°: RI-261499
Project type: CP-CSA
Start date: 01/09/2010
Duration: 24 months

Total budget: 3 885 196 €
Funding from the EC: 2 100 000 €
Total funded effort in person-month: 539,5
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High-Performance Computing Infrastructure for South East Europe's Research Communities

HP-SEE

High-Performance Computing Infrastructure for South East Europe's Research Communities

HP-SEE, High-Performance Computing Infrastructure for South East Europe's Research Communities will link existing and upcoming HPC facilities in South East Europe in a common infrastructure, and it will provide operational solutions for it. As a complementary action, the project will establish and maintain a GÉANT link for Southern Caucasus. The initiative will open the South East European HPC infrastructure to a wide range of new user communities, including those of less-resourced countries, fostering collaboration and providing advanced capabilities to researchers, with an emphasis on strategic groups in computational physics, computational chemistry and life sciences. HP-SEE receives EC support through FP7 under the "Research Infrastructures" action.

The HP-SEE initiative builds on the lasting cooperation in the SEE region, embodied in a number of eInfrastructure EC-funded initiatives, aiming at equal participation of less-resourced countries of the region in European trends. The SEEREN initiative established a regional network and the SEE-GRID initiative the regional Grid, while BSI project has established GÉANT link to South Caucasus. The SEE-LIGHT project is working towards establishing a dark-fibre backbone that will interconnect most National Research and Education Networks in the Balkan region.

HP-SEE aspires to contribute to the stabilisation and development of South-East Europe, by overcoming fragmentation in Europe and stimulating eInfrastructure development and adoption by new virtual research communities, thus enabling collaborative high-quality research across a spectrum of scientific fields.

User communities

HP-SEE will support and strengthen a number of **strategic Virtual Research Communities**, which will bring together users across the region within a common cooperative research space, enabling them to share HPC facilities, software, tools, data and results of their work. Thus, the project will directly contribute to the co-ordination of high-quality research and ease the access to and enhance the usability of the available infrastructure. The core international scientific fields identified as self-standing Virtual Research Communities are **Computational Physics**, **Computational Chemistry** and **Life Science Virtual Community**.

Computational Physics community: Computational physics is nowadays the main beneficiary of the scientific HPC, large-scale numerical computations being necessary whenever the complexity of the physical systems investigated does not allow the derivation of an analytical solution. The main objective of the Computational Physics VRC is to join together the various physics research teams from the SEE area and to provide them access to a powerful HPC infrastructure and tools, which will make possible their participation in multidisciplinary and international collaborations.

For this purpose, software developers from 6 countries will contribute with 8 applications in the fields of High Energy and Particle Physics, Plasma Physics, Physics of Condensed Matter, Atomic Physics, and Computational Fluid Dynamics.
The application range extends from nanoelectronics, micro-devices optimization and the modeling of robotic devices for biomedicine, to improved means for feature detection in satellite images, which leads to better mapping, localization and search services.

Computational Chemistry virtual research community: Computational chemistry and material science is one of the highlighted research areas in computational science and a typical heavy user of HPC resources. The computational technologies are an indispensable tool for investigations in domains like quantum molecular dynamics, molecular modelling, nano-technology and design of new materials. Considering the size of the problems to be studied, the required calculations are extremely computationally intensive. Thus HPC would greatly facilitate the proposed work allowing the researchers to deal not only with "pilot" or model systems but to work on big and complicated real systems, which are physically and technologically more significant and challenging. These studies will extend understanding of some fundamental science issues and are of practical importance for pharmaceutical industry, nanotechnology, biomedicine, and many others.

Initially Computational Chemistry VRC supports 7 applications with main developers in 6 SEE countries, collaborating with scientists from more than 20 advanced research centers in Europe.

Life Sciences community: Life Sciences depend heavily on the use of HPC for both data mining and data integration as well as for the simulation of biological systems. HPC technologies are essential for research areas such us genome analysis, expression profiling, -omics data analysis and biological simulations, whereby a vast amount of experimental data needs to be analyzed and synthesized into reasonable hypothesis. Thus HPC would greatly facilitate the various applications described in this project, enabling the respective research teams to study questions that have thus far been intractable due to their high computational complexity. The use of HPC in the Life Sciences applications with help will better understanding of basic problems in the fields of DNA sequence analysis, comparative genomics, and brain modeling among others and can be of great importance for the health sector.

The Life Sciences VRC supports 7 applications with main developers in 5 SEE countries (Greece, Hungary, Montenegro, Armenia, Georgia) working in the areas of computational biology, computational biophysics, DNA sequence analysis and computational genomics. The various projects involve collaborations with numerous scientists both in Europe and the U.S. and will foster the development of new collaborations among the participant SEE countries.

International aspects

HP-SEE will address the needs of a number of new multi-disciplinary international scientific communities and thus stimulate the use and expansion of the emerging new regional HPC infrastructure and its services. The project aims to further strengthen the collaboration of distributed teams of scientists in the South East European region and beyond, paving the way towards a long-term vision of a sustainable, transparent, ubiquitous electronic infrastructure open to a wide range of scientific user communities. The involvement of scientists from the countries of the Black Sea region contributes also towards the achievement of the Black Sea Synergy Initiative aims. Regional scientists and engineers that will be provided with access to capability computers of leadership-class, will remain competitive at the European and international level, thus overcoming fragmentation in Europe.