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From Scalable, Semantically-based Distributed Computing to Exascale Computing

Abstract:

Complex applications, respectively, complex use cases have been a great motivation for developing new distributed systems. So were the demands to develop a Support Decision System for flood prevention and protection, integrating the most advanced techniques in data processing and management (EU FP5 IST RTD project: datA fusioN for Flood Analysis and decision Support IST-1999-11676, 2000-2003). At that time the Remote Procedure Call technology was used, which was the predecessor to grid technology. II SAS successfully has participated in the solution of this project and it has to be said that this was a historic moment for our motivation for grid technology activities. That was the first project EU FP5 IST RTD project: Development of Grid Environment for Interactive Applications (2002-05) IST-2001-32243 (CrossGrid) with aim to develop, implement and exploit new Grid components for interactive computing and data intensive applications like simulation and visualization for surgical procedures, flooding crisis, team decision support systems, distributed data analysis in high-energy physics, air pollution combined with weather forecasting. In the project EU FP6 RTD IST project: Knowledge-based Workflow System for Grid Applications (2004-2007) FP6-511385 [call IST-2002-2.3.2.8, STREP] we have first time proposed to use the semantic grid term with focus on some selected complex problems. From scalable, semantically-based computing we have gradually moved to exascale computing as part of the 7FP and Horizon 2020 Programmes. In my presentation I will touch the current research activities within the exascale computing and processing big data (extreme data sets) mainly in projects: Integrating and managing services for the European Open Science Cloud (1.1.2018-31.12.2020) H2020-777536 [call H2020-EINFRA-2016-2017], Designing and Enabling E-infrastructures for intensive Processing in a Hybrid DataCloud (1.11.2017-30.4.2020) H2020-777435 [call H2020-EINFRA-2016-2017], PROviding Computing solutions for ExaScale ChallengeS (1.11.2017-31.10.2020) H2020-777533 [call H2020-EINFRA-2016-2017], EU FP7 project: Advanced Data Mining and Integration Research for Europe (2008-2011) FP7-215024 [call FP7-ICT-2007-1], EDA project: European Urban Simulation for Asymmetric Scenarios (2010-2012) A-0938-RT-GC requiring HPC.