HP and High Performance Computing in Albania

Research Infrastructures and Projects on HPC

“The recent growth of the high-performance computing (HPC) market, powered almost exclusively by the adoption of Linux clusters, has been dramatic…

The Strategy of the Market Share Leader in High-Performance Computing. S. Conway et al., White Paper sponsored by Hewlett-Packard, February 2009

HP and HPC in Albanian Research

Long history of HP in Albanian research environment

- First Unix graphic workstations in early nineties
  - CAD applications, development of X-windows applications, image processing

- Grid infrastructure from 2004 based in HP platforms
  - EC Framework Projects SEE-GRID, SEE-GRID2, SEE-GRID-SCI
  - HP clusters integrated in SEE regional grid infrastructure
  - First grid applications

- Actual trend – High Performance Computing based in HP platforms

EC FP7 Project 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
- will open the SEE HPC infrastructure to user communities, providing advanced capabilities with an emphasis on physics, chemistry and life sciences.
- builds on the lasting cooperation in the SEE region, embodied in a number of eInfrastructure EC-funded initiatives:
  - SEEREN initiative established a regional network, and
  - SEE-GRID initiative the regional Grid

The Need for HPC in Albanian Research

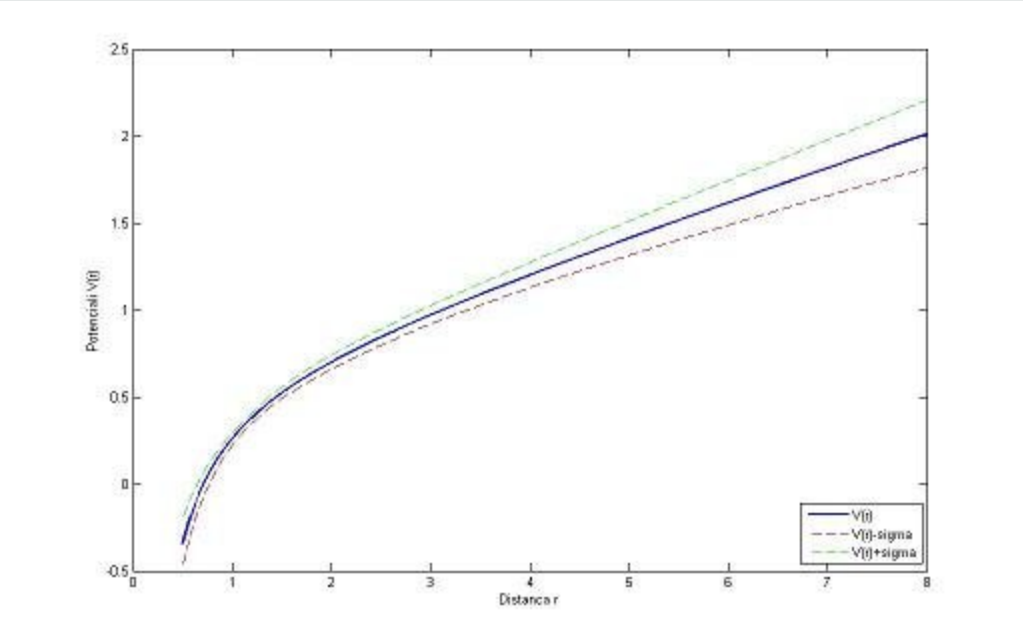
Applications from physics and other research areas

Based on actual working groups:

- High energy physics
  - HMLQCD: Hadron Masses from Lattice QCD (Albanian primary application in HP-SEE)
    - 2 recent papers in HP-SEE User Forum 2012
- Geophysics
  - GIM: Geophysical Inversion Modeling (Albanian secondary application in HP-SEE)
    - 6 papers published in 2010 – 2012
- Complex systems
- Economic and Financial models
- Environmental studies
  - Satellite image processing application CHERS (project SEE-GRID-SCI)
    - 4 papers published in 2010 – 2012

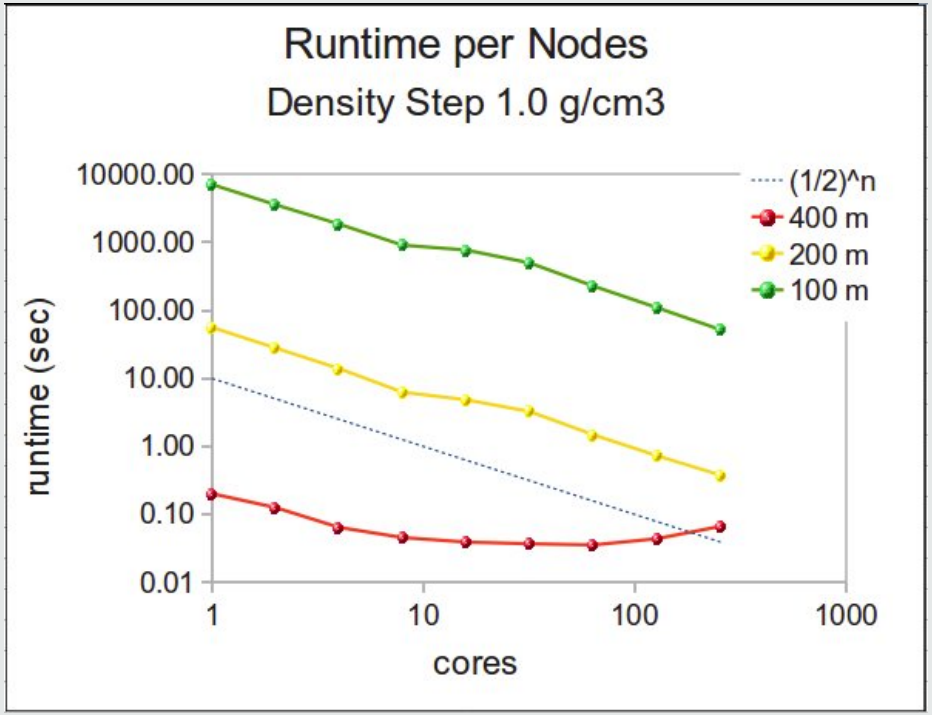
HMLQCD in pratice

Calculation of quark-antiquark potential for 8^4 lattice volume, coupling constant beta=5.7, and number of configuration 100, using 4-processors.



GIM in practice

Scalability of GIM (version MPI) in HPCG-BAS, Bulgaria.



HPC Research Infrastructure in Albania

Old Grid Cluster in Polytechnic University (SEE-GRID):

- HP ProLiant DL320 Generation 5p
  - Dual-Core Intel Xeon processor 3065
  - 1 GB PC2-6400 (800MHz) DDR2 SDRAM
  - 1 x 250GB SATA HDD

New Parallel System in Polytechnic University (donation from China):

- 30 Blade computer nodes
  - 2 x Intel Xeon E5506 2.13GHz
  - Total of 240 processing cores
  - In installation stage

Ways for Collaboration

HP is key partner for high performance infrastructure

Do we need HPC capacities for research?

- Very positive Grid and HPC experience.
- HPC already in IT curricula in university computer departments
  - Lectures and diploma works related with HPC
- First cases HPC research and development requested by companies
- Tendencies for the future
  - Use of HPC clusters and parallel computers for cloud systems
- Ways of collaboration
  - Platforms from producer
  - Thematics from business
  - Solutions from academia

Thank you