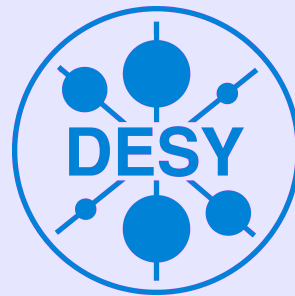


Simulation labs: A new model for research community support

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ZCUM11, 21 March 2011

Concept

- Simulation Laboratory (SL) = Competence centre for a specific research community
 - Performs research and provides support
 - Research staff is part of the community
- Tasks
 - Development of HPC eco-system tailored for the target research community
 - Assist in optimizing use of available compute resources
 - Perform large-scale simulations
 - Provide field-specific training

Realisation in Germany

- SLs first established at Jülich Supercomputing Centre (JSC)
 - Established SLs: Biology, Plasma Physics, Molecular Systems, Climate Science
 - More SimLabs planned
- SLs have become part of HGF program “Supercomputing”
 - SLs at KIT: NanoMicro, Astro- and Elementary Particles

Structure and operation

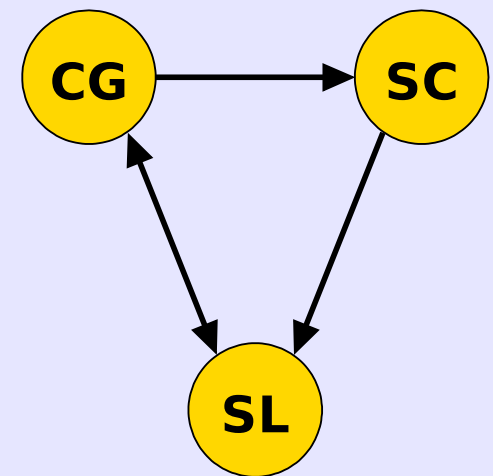
(as proposed by JSC)

- Structure

- Minimal SL team size: 1 senior scientist, 1-2 post-docs, PhD & MSc students (+ technical staff)
- Steering Committee (SC) with members from research community (and hosting institution)

- Operation

- Community research groups (CG)
 - Make proposals for work program
 - Submit request for support
- SC defines work program



Lattice QCD SL at DESY

- Status: Joined SL for LQCD under discussion
 - Involved institutions: CaSToRC (Cyprus), JSC (Jülich), DESY (Zeuthen)
- Tasks:
 - Development of algorithms and optimized implementation of application kernels
 - Performance benchmarking and analysis
 - Analysis and development of HPC architectures
 - Data curation
 - Training
 - Large-scale simulations and LQCD research

Tentative work program

- WP1: Algorithms and Application Kernels
 - Analysis of cache efficiency of kernel implementations
 - Hybrid-parallelization of application program DD-HMC
- WP2: Application Requirements and Performance Analysis
 - Definition and compilation of LQCD benchmark suite
 - Parametric performance model for benchmark suite
- WP3: Analysis and Development of HPC Architectures
 - Technical design studies
- WP4: Data Curation and LatFor Data Grid (LDG)
 - ILDG working groups, LDG operation, VO management
- WP5: Training
 - “Lattice Practices” workshops, summer students