Title: Introduction; Computing environment at Perimeter

Date: Feb 09, 2012 09:30 AM

URL: http://pirsa.org/12020140

Abstract:

Computational Methods at Perimeter

9:30 Erik Schnetter: Introduction; Computing environment at Perimeter
9:55 Lukasz Cincio: Tensor Networks
10:20 Bianca Dittrich: Coarse graining spin nets with tensor networks
10:45 Coffee & cookies served (bistro)
11:15 Chad Hanna: Computational methods: (Now with data)
11:40 Matt Johnson: Feature-finding in the cosmic microwave background
12:05 Itay Yavin: Computing in High Energy Physics
12:30 Lunch break
14:00 Avery Broderick: The Tyranny of Scale: Making Simple Problems Hard
14:25 David Rideout: Frameworks for Scientific Computing
14:50 Erik Schnetter: Computational Relativistic Astrophysics
15:15 Coffee & cookies served (bistro)
15:45 Marcus Appleby: Galois calculations using Magma
16:10 Pedro Vieira: Mathematica and Symbolic Computations
16:35 Rafael Sorkin: A Lisp "scratch-pad" for working with posets

Formalities

- <u>Aim</u>: We want to learn what computational methods others are using
- Small audience – flexible schedule
  - talk time: 20+5
- Coffee and cookies served in the bistro
- No free lunch
- Afterwards: Pub night

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Perimeter's Scientific Computing Infrastructure

Erik Schnetter, Perimeter Institute
Waterloo, February 9, 2012

Computing Hardware

- SCE: Scientific Computing Environment:
  - (shared) set of workstations/servers
  - also a GPU (CUDA) system
- HPC: High Performance Computing system:
  - ready (mod cooling problems)
  - some parts temporarily moving to SCE
- External facilities:
  - Compute Canada: Sharcnet, Scinet, ...

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Disk Storage

- Shared home directories across Perimeter:
  - Currently slow – new faster & larger storage being set up
- Data storage:
  - HPC will have 20 TByte
- Fast network connection to the outside (Orion)

Things That Make Computing Difficult...

(...apart from the obvious:)

- May need to use several computers, but:
  - Different software, different versions
  - Different home directories
- Batch processing (queuing systems)
  - [system usage > researcher wasted time]
- Planning to address these at Perimeter

New Kind of Supercomputing?

- Traditional: number crunching:
  - performance measured in *Top500* list (started 20 years ago)
  - based on Linpack algorithm (written 30 years ago)
- Modern challenges: graph processing:
  - graphs, networks, formulae, etc. (see *Graph500*); (almost) no numbers involved

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SPACES

- Tools and services to support small, informal collaborations:
  - Each "space" has web pages, wiki, blog, mailing list, svn, git, file storage, a virtual machine, ...
  - Could be used for projects, papers, research notes, software
  - Spaces are cheap, can have many
- Coming soon: spaces.perimeterinstitute.ca

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- Liaison between IT Department and Researchers

- Advice/experience/support/contributions for research-related "technologies"

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