The HUBzero™ Platform for Scientific Collaboration

Barry Johnson
Director of Virtual Organization
Clemson University
Special Thanks To:

Michael McLennan
Senior Research Scientist and Hub Software Architect
Rosen Center for Advanced Computing
Purdue University
HUB = Platform for Scientific Collaboration

Online simulation… …and more!
Platform for Scientific Collaboration

- Tools powered by Grid infrastructure
- Virtual economy for incentives and managing resources
- Little bit of social networking: e.g., Questions & Answers
- Secure execution environment
- Integrated visualization
- “YouTube” for simulation and modeling tools
What is a HUB?

Example: nanoHUB.org

Demo: AVI  MOV  YouTube
153,704 users worldwide

As much traffic as www.purdue.edu
Users at all Top 50 US Engr Schools
19% of all .edu domains
116 classes at 97 institutions in 2009
8,800 users ran 348,000 simulations
Supporting Education

ECE 612 Nanoscale Transistors (Fall 2006)

Contributor(s)  Mark Lundstrom
                Purdue University, West Lafayette

Abstract  Please Note: An updated version of this course is in production for
          physics of advanced transistors.

Teaching Materials:
• Complete courses
• Tutorials and Podcasts
• Homework assignments

Simulation tools:
• Demonstrations in class
• Homework assignments
• Class projects
Educational Use Is Growing

116 classes at 97 institutions in 2009

nanoHUB.org Educational Usage
Simulation tools:
• Used by theorists
• Used by experimentalists

Tutorials and Seminars:
• Cutting edge research
• Cited in journal articles
• Preprints and tech pubs

[2] The justification for this value of switching energy in practical present-day circuits can be found e.g. in Mukhopadhyay S. Switching energy in CMOS logic: how far are we from physical limit? Available from <http://www.nanohub.org/resources/1250/>.

[3] Zhimov VV, Cavin RK, Hutchby JA, Bourianoff GI. Limits to...
Open Source Platform

- Feb 2007: 1 hub
- Feb 2008: 5 hubs
- Feb 2009: 8 hubs
- Today: 30 hubs

Each hub has its own funding stream

Outside institutions:
EPA, NYSTAR, Rice
Go see for yourself!

https://hubzero.org/sites
Thanks

- Email: hbj@clemson.edu
- Twitter: BarryJohnsonSC