Information Technology: Purdue’s Moneyball
Board of Trustees • February 3, 2012

Dr. Gerry McCartney
Vice President for Information Technology and CIO
Olga Oesterle England Professor of Information Technology
KEEPING THE BUSES RUNNING 2011

149,241 PODCASTING downloads

COMPUTER LABS
1.4 M hours per semester
1,925 machines

1,925 machines

STORAGE
1,124 terabytes of capacity

NETWORK
41,932 connections per day

1,925 machines

TELEPHONES
20,680 lines

41,932 connections per day

WIRELESS
30,000 average peak users per month

HPC
162,659,806 hours per year

41,932 connections per day

SERVERS
482 physical
688 virtual

GRID COMPUTING
25,403,272

73,891 student use

73,891 student use

1,4 M hours per semester

BANNER & VISTA
18,769 average unique users per day
45,299 average logins per day

9,176 courses managed

18,769 average unique users per day

EMAIL
1.21M transactions per day

1.21M transactions per day

73,891 student use

TELEPHONES
20,680 lines

45,299 average logins per day

73,891 student use

5,577 faculty use

45,299 average logins per day

5,577 faculty use

9,176 courses managed

73,891 student use

9,176 courses managed

HPC
162,659,806 hours per year

162,659,806 hours per year

5,577 faculty use

162,659,806 hours per year

GRID COMPUTING
25,403,272

73,891 student use

162,659,806 hours per year

482 physical

162,659,806 hours per year

688 virtual

BANNER & VISTA
18,769 average unique users per day

BANNER & VISTA
18,769 average unique users per day

18,769 average unique users per day
NEW TOOLS FOR RESEARCH AND INSTRUCTION

NON-STRATEGIC INNOVATION

BREAK/FIX
PERCENTAGE OF RESEARCH AWARDS INVOLVING HIGH-PERFORMANCE COMPUTING

- Awardees Using Research Computing
- Total Purdue Research Awards

<table>
<thead>
<tr>
<th>Year</th>
<th>Awardees Using Research Computing</th>
<th>Total Purdue Research Awards</th>
</tr>
</thead>
<tbody>
<tr>
<td>1997</td>
<td>$129.9 4%</td>
<td>$4.7</td>
</tr>
<tr>
<td>1998</td>
<td>$132.2 6%</td>
<td>$5.5</td>
</tr>
<tr>
<td>1999</td>
<td>$134.5 9%</td>
<td>$6.0</td>
</tr>
<tr>
<td>2000</td>
<td>$160.2 9%</td>
<td>$10.1</td>
</tr>
<tr>
<td>2001</td>
<td>$190.3 6%</td>
<td>$17.2</td>
</tr>
<tr>
<td>2002</td>
<td>$222.9 9%</td>
<td>$207.7</td>
</tr>
<tr>
<td>2003</td>
<td>$235.6 11%</td>
<td>$284.7</td>
</tr>
<tr>
<td>2004</td>
<td>$31.7 13%</td>
<td>$235.6</td>
</tr>
<tr>
<td>2005</td>
<td>$38.1 13%</td>
<td>$251.6</td>
</tr>
<tr>
<td>2006</td>
<td>$37.1 15%</td>
<td>$292.2</td>
</tr>
<tr>
<td>2007</td>
<td>$43.3 15%</td>
<td>$322.8</td>
</tr>
<tr>
<td>2008</td>
<td>$73.0 23%</td>
<td>$327.5</td>
</tr>
<tr>
<td>2009</td>
<td>$80.7 25%</td>
<td>$418.0</td>
</tr>
<tr>
<td>2010</td>
<td>$165.0 39%</td>
<td>$401.4</td>
</tr>
<tr>
<td>2011</td>
<td>$182.0 45%</td>
<td></td>
</tr>
<tr>
<td>Rank</td>
<td>Institution</td>
<td>Teraflops</td>
</tr>
<tr>
<td>------</td>
<td>-------------------------------------------------</td>
<td>-----------</td>
</tr>
<tr>
<td>1.</td>
<td>National Institute for Comp. Sciences University of Tennessee</td>
<td>919</td>
</tr>
<tr>
<td>2.</td>
<td>Texas Advanced Computing Center University of Texas</td>
<td>685</td>
</tr>
<tr>
<td>3.</td>
<td>Purdue University</td>
<td>315</td>
</tr>
<tr>
<td>4.</td>
<td>UCSD/San Diego Supercomputer Center</td>
<td>285</td>
</tr>
<tr>
<td>5.</td>
<td>Georgia Institute of Technology</td>
<td>159</td>
</tr>
<tr>
<td>6.</td>
<td>University of Colorado</td>
<td>152</td>
</tr>
<tr>
<td>7.</td>
<td>University of Southern California</td>
<td>150</td>
</tr>
<tr>
<td>8.</td>
<td>University of Chicago</td>
<td>126</td>
</tr>
<tr>
<td>9.</td>
<td>Virginia Tech</td>
<td>120</td>
</tr>
<tr>
<td>10.</td>
<td>Clemson University</td>
<td>97</td>
</tr>
</tbody>
</table>

As of November 2011
We found that our Large Eddy Simulation (LES) code is about two times faster. We have already done a couple of production runs with 100 million grid points in an impressive turn-around time. — Prof. Gregory Blaisdell, aeronautics and astronautics
Indiana University, Iowa, Michigan, Michigan State, Ohio State, Penn State, Nebraska, Northwestern and Wisconsin do not have supercomputers in the Top 500.
Compared costs reflect CPU performance of similar scale.
NOW IN BOOK-O-MAT

25¢

OVER 50 SELECTIONS

OVER 160,000,000
POCKETBOOKS
SOLD ALREADY

NOW IN POCKETBOOKS
“A small handful of schools, in particular **Purdue University**, seem capable of building this technology internally, with projects such as Mixable and Hotseat.”

—Inside Higher Ed
Speaking Up in Class, Silently, Using Social Media

JetPack opens up many opportunities. I can include a problem in the text, the students can call up the calculator and work the problem, and later I can see they solved it correctly. I can instruct them while they are on their phone as they wait for the bus, explaining the day’s lesson to them for a second time.
I had explored using an external publishing company to create my own materials for this new course, but the cost to each student would have been more than $100. Students actually cheered this semester when I told them I would instead be using **JetPack**, which allows them to download their course materials for free.

It’s crucial my students have the class materials at their fingertips because it’s often too much content to walk them through all of it step-by-step. I was complaining to other faculty about the lack of available tools to help me distill or mix and match chapters from different textbooks. I assumed people had solved this problem before, but they hadn’t, so I was very happy when I found out Jetpack was being developed here at Purdue. *Not only is ITaP ahead of the curve in terms of developing this course material tool for students, but they’re also identifying what the curve should be.*

Jennifer Neville
Assistant Professor of Computer Science

Mike Jacob
Professor of Electrical and Computer Engineering Technology
At Purdue since 2007
• 23,675 students
• 145 faculty
• 100 courses
• 228 sections

Gates Grant Participating Institutions

<table>
<thead>
<tr>
<th>Institution</th>
<th>State</th>
<th>Community College</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anoka-Ramsey Community College</td>
<td>MN</td>
<td>X</td>
</tr>
<tr>
<td>Colorado Community College System</td>
<td>CO</td>
<td>X</td>
</tr>
<tr>
<td>Rio Salado Community College</td>
<td>AZ</td>
<td>X</td>
</tr>
<tr>
<td>Southern Illinois University Carbondale</td>
<td>IL</td>
<td></td>
</tr>
<tr>
<td>University of Maryland Baltimore County</td>
<td>MD</td>
<td></td>
</tr>
<tr>
<td>University of Toledo</td>
<td>OH</td>
<td></td>
</tr>
<tr>
<td>Valencia Community College (system)</td>
<td>FL</td>
<td>X</td>
</tr>
<tr>
<td>Zane State College</td>
<td>OH</td>
<td>X</td>
</tr>
</tbody>
</table>

Current and Future Course Signals Users

Currently live:
• Muskegon Community College (MI)
• University of Toledo (OH)

Going live:
• Kent State (OH)
• Northeast Wisconsin Technical College
• Northeast State Community College (TN)
• Victoria University Wellington (NZ)

Recently signed:
• Colorado Community College System
  (13 institutions)
• College of Saint Scholastica (MN)
NEW TOOLS FOR RESEARCH AND INSTRUCTION

NON-STRATEGIC INNOVATION

BREAK/FIX