

A Word on Off-Shoring: Causes

1. Technology – successes of computer science and computer engineering!

The “Death of Distance”

If it can be bits, it’s up for grabs

No Neo-Luddites out there

2. Economics – business realities

Off-Shoring Economics - 5Cs

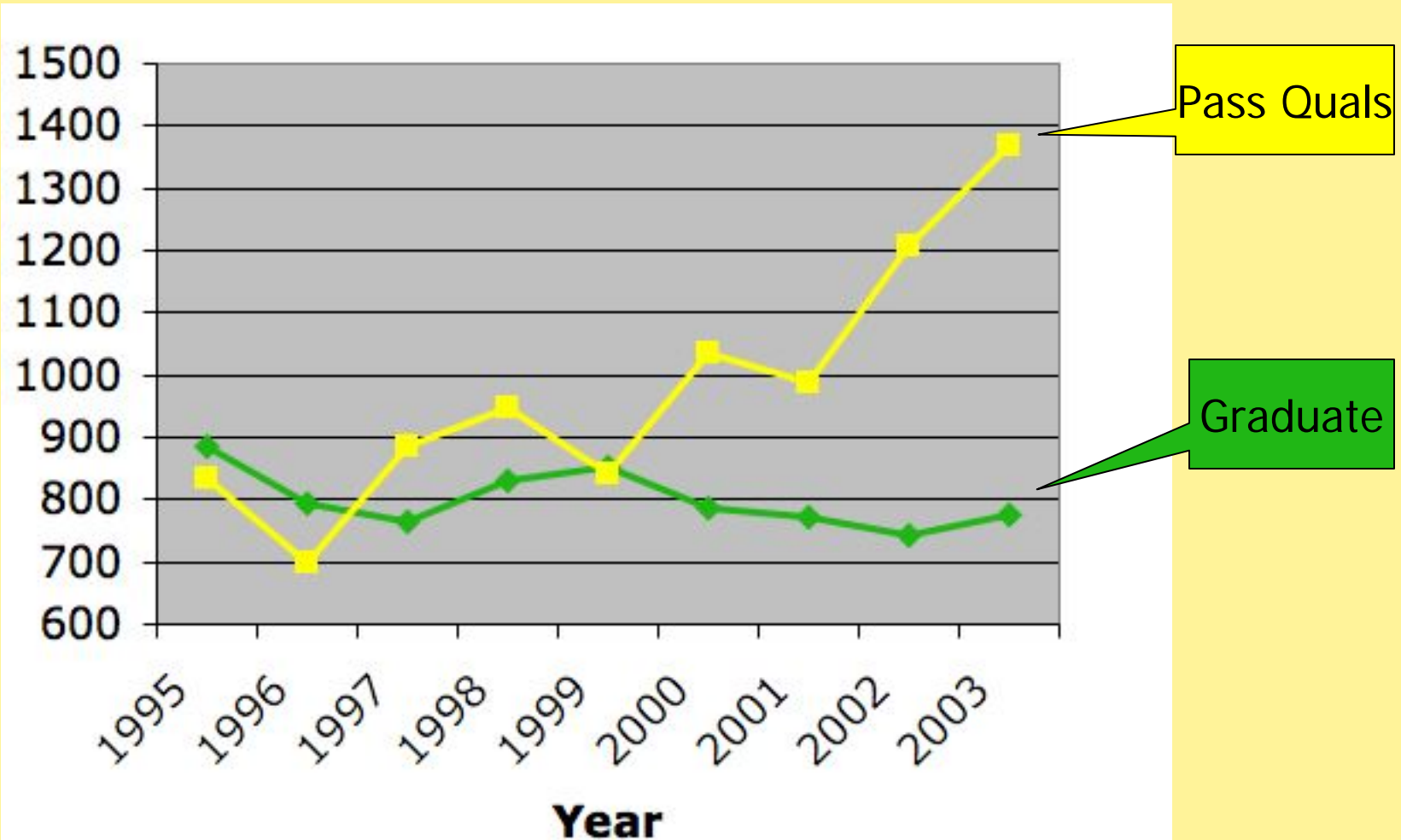
- Closer to market
- Closer to suppliers
- Closer to talent
- Closer to politicians - to do business
- Cost reduction - just one of many considerations
 - Labor
 - Infrastructure
 - Taxes and regulations
 - Government subsidies

Triple Whammy has Driven Down UG Enrollments

- Undergraduate – perceived low demand
 - Newly-declared CS/CE undergrads in 2003
 - Down 22% to 18,000 (2003 Taulbee)
 - A strong trend
- *Which in turn can affect our financial viability*

Good News – PhD Production

Finally Trending Back Up



CRA Role

- Data - Taulbee Survey
- Pipeline
 - CRA-W
 - Support Coalition to Diversify Computing
- Support changes to Visa process
- Much needed beyond what CRA can do -
High School and earlier

Triple Whammy + Other Factors => Positive Impacts on Universities

- Re-examine what we teach in CS/IT
 - Connect computing with X
 - X = people, biology, science, business, etc.
 - Two of the PITAC topics do this
 - Health and IT, Computational Science
 - Computing and IT \supset Computer Science
 - “Customer Facing” knowledge and skills

Warren Washington - Chair, NSB

"Academic institutions need to change to educate students in a much broader context than they do now. You'll be hearing enlightened university presidents talking about this. But down at the department level, there's this focusing only on the narrow sort of discipline objectives. That's where it's going to be hard to make changes."

Quoted in the Chronicle of Higher Education

An Inflection Point for Computing?

- Opportunity to really examine Computing Education and Research
- “Triple Whammy” gave us breathing space and motivation
- Potential Crises in Funding and Pipeline
- Self-examination of what is computing

So What Can CRA Do About
This New World?

CRA Role – New Activity

- Pipeline
 - The case for grad school
 - Why strong BS students don't go to grad school
- Improving graduate education
 - Best practices
 - Courses beyond computing - broadening
- If we stand still, we will fall behind
- Interested? Talk to Jack Stankovic

CRA – New Activity

- PhD opportunities beyond professoriate and research labs
- Interested? Talk to Marc Snir

CRA – New Activity

- Computing Research is increasingly interdisciplinary
- Faculty are increasingly interdisciplinary
- Need best practices in evaluating interdisciplinary faculty?
- Interested? Talk to Dan Reed

CRA as Catalyst

- Leadership Summit Tomorrow
 - AAAI, ACM, CACS/AIC, CRA, CSTB
 - IEEE-CS, NSF, PITAC, SIAM, USENIX
- Strategies / cooperation on
 - Defining Computing & Computing Education
 - Sharpening and Delivering the Computing Message
 - The Case for Computing as an Undergrad Major/Minor
 - The Case for Graduate School
 - The Case for Computing Research Funding

More Generally

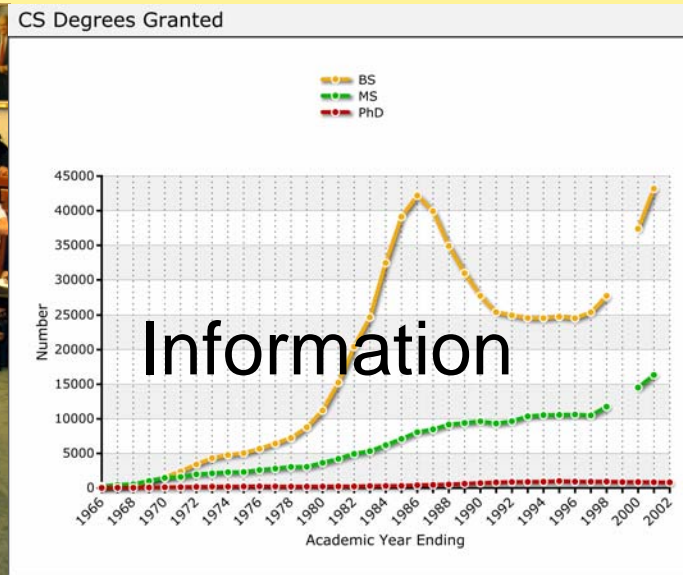
- Time for broader community involvement in CRA
 - CRA-W and Snowbird already there
- Participate in existing committees
- Participate in new activities
- Chairs – please identify
 - Promising Associate Professor
 - Seasoned Full Professor

CRA Finances are Strong



- Growing membership
- Stable revenue
- Sufficient reserves

CRA Does



CRA Mission Areas

<p style="text-align: center;">Policy</p> <p>IT Research Funding and Research Environment Tracking Budgets Educating Members on Advocacy CRAN (advocacy network) Testimony Submissions to Congressional Committees Policy Reports Workforce Policy Issues Related to Women and Minorities News Conferences Congressional Visits Publications Policy Blog Website</p>	<p style="text-align: center;">Information Gathering and Dissemination</p> <p>Computing Research News (<i>CRN</i>) Computing Research Bulletin Surveys—Taubee, Profiles, Lab Salaries CRA Best Practices Reports Forsythe List/Address Labels CRA-W Careers Booklet CRA-W Graduate School Information Guide Publications Brochures Annual Reports Websites—CRA, CRA-W, CDC Conferences, Workshops</p>
<p style="text-align: center;">Human Resources</p> <p>Job Service Workforce Issues Academic Careers Workshop CRA-W Support CRA-W/Lucent Distinguished Lecture Series CRA-W Distributed Mentor Project CRA-W Career Mentoring Workshops CRA-W Collaborative Research Experiences for Undergraduates (CREU) CRA-W Grad Cohort Program CRA-W Cohort for Associate Professors Project CRA-W Recruitment and Retention Report Recruitment and Retention of Women in CS&E Graduate Programs Study CRA-W "Expanding the Pipeline" Column in <i>CRN</i> CDC Support CDC Recruitment and Retention Report Sessions at Snowbird CDC Tapia Conference Outstanding Undergraduate Awards A. Nico Habermann Award CRA-W Anita Borg Early Career Award</p>	<p style="text-align: center;">Community Building</p> <p>CRA Conference at Snowbird (biennial) Computing Leadership Summit Lab Directors Regional Meetings IT Deans Meetings CRA Membership Activities Distinguished Service Award External Awards Industry-University Relations Industry-University Model Agreements Grand Challenges Conference CRA-W/Lucent Technologies Distinguished Lectures Conferences, Workshops</p>

CRA Does Computing Research Policy

The blog

The screenshot shows a web browser window with the address bar containing `http://www.cra.org/govaffairs/blog/index.php`. The browser's navigation bar includes a search box with the Google logo and a menu with items like 'morning', 'blog', 'Macintosh', 'Organizations', 'Machining', 'Railroads', 'Software', and 'SCUBA'. The website header features the CRA logo (Computing Research Association) and the title 'Computing Research Policy Blog' with the subtitle 'Advocacy and Policy Analysis for the Computing Research Community'. A horizontal navigation menu contains links for 'Advocacy', 'CRAN', 'Policy Issues', 'Budget', 'Congress', 'Executive Branch', and 'Archives'. On the left side, there is a vertical menu with links such as 'Awards', 'Events', 'Gov't Affairs', 'Information', 'Jobs', 'Committees', 'People', 'Publications', 'What's New', and 'Home'. Below this is a search box with the text 'SEARCH' and 'Search this site:'. Further down is an 'ARCHIVES' section with a list of months from June 2004 to January 2004. At the bottom left is a 'RECENT ENTRIES' section listing several articles. The main content area is dated 'JUNE 23, 2004' and features two articles. The first article is titled 'SCI COM TO HOLD E-VOTING HEARING THURSDAY' and discusses a hearing on testing and certification for voting equipment. The second article is titled 'PICS FROM THE CNSF SCIENCE EXHIBITION ON CAPITOL HILL' and describes CRA's participation in a science exhibition. The text of the second article is partially cut off at the bottom.

Computing Research Policy Blog

http://www.cra.org/govaffairs/blog/index.php

morning ▾ blog Macintosh ▾ Organizations ▾ Machining ▾ Railroads ▾ Software ▾ SCUBA ▾

Computing Research Policy...

 **Computing Research Policy Blog**
Advocacy and Policy Analysis for the Computing Research Community

Advocacy CRAN Policy Issues Budget Congress Executive Branch Archives

JUNE 23, 2004

SCI COM TO HOLD E-VOTING HEARING THURSDAY

The House Science Committee will hold [a hearing](#) on testing and certification for voting equipment. Here's an early version of the [hearing charter](#).

Posted by PeterHarsha at [08:16 PM](#) | [TrackBack \(0\)](#)

PICS FROM THE CNSF SCIENCE EXHIBITION ON CAPITOL HILL

CRA joined 31 other scientific societies and universities yesterday in showing off the results of NSF-sponsored research at the 10th annual [Coalition for National Science Funding](#) Science Exhibition and Reception on Capitol Hill. CRA was ably represented at the event by [DK Panda](#) and his students (Jiuxing Liu, Pavan Balaji, Ranjit Noronha, and Sayantan Sur) from [The Ohio State University](#), who presented work on software that allows high performance, scalable communication using the InfiniBand networking technology.

The Exhibition was a great opportunity for making the general case for federal support of basic research, especially at NSF. This year's event was widely-attended. Many key congressional staffers, influential Members of Congress, and important members of the Administration and NSF took time out of their schedules to see the exhibits. Here's the proof! (click for larger images)

 The CRA booth. Underneath the table were four

Awards
Events
Gov't Affairs
Information
Jobs
Committees
People
Publications
What's New
Home

SEARCH

Search this site:

ARCHIVES

June 2004
May 2004
April 2004
March 2004
February 2004
January 2004

RECENT ENTRIES

Sci Com to hold E-voting Hearing Thursday
Pics from the CNSF Science Exhibition on Capitol Hill
Senate Hearing on High End Computing at DOE
DMCA Reform Gathering Momentum? Latest PITAC Highlights

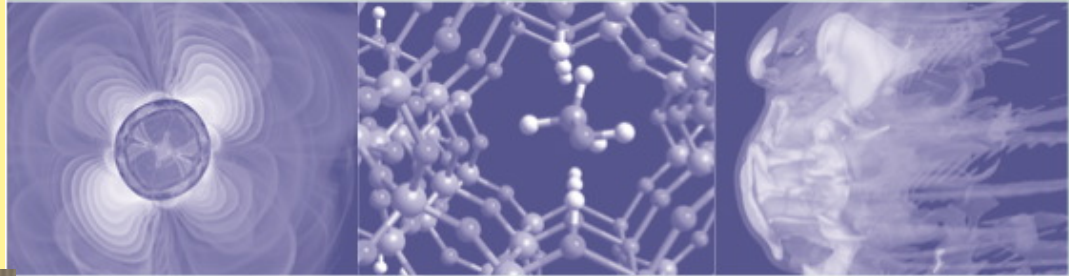
When CRA Talks, People Listen



CRA
Organizes
Workshops
that
Drive Policy

Workshop on

The Roadmap for the Revitalization of High-End Computing



COMPUTING RESEARCH ASSOCIATION

June 16-18, 2003

Edited by Daniel A. Reed





Everyone
gets advice
from



CRA Does Computing Research Information

Table 1. Base Salaries in Industrial Research Labs by Years of Post-Ph.D. Experience (thousands of dollars)

	2001		2002	
	Median	Mean	Median	Mean
New PhD	97.5	98.8	99.7	99.5
1-5 Years	105.2	107.1	110.4	112.9
6-10 Years	124.3	126.3	129.9	132.2
11-15 Years	134.2	134.3	140.8	141.7
16+ Years	138.0	139.3	147.1	147.5

Table 2. Total Cash Compensation* by Years of Post-Ph.D. Experience (thousands of dollars)

	2001		2002	
	Median	Mean	Median	Mean
New PhD	105.7	107.1	105.7	103.2
1-5 Years	113.1	114.9	117.1	120.6
6-10 Years	133.6	136.5	139.8	143.6
11-15 Years	143.7	145.0	151.1	152.8
16+ Years	147.2	150.2	157.3	159.0

* Total Cash Compensation is base salary plus additional cash (e.g., bonus) items.

Figure 6. BS Production

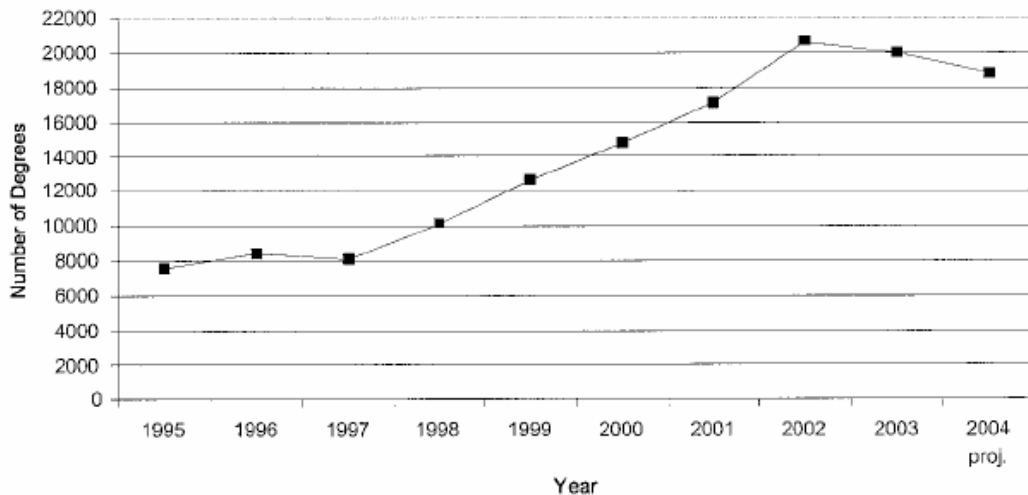


Figure 3. PhD Pipeline Corrected for Year of Entry

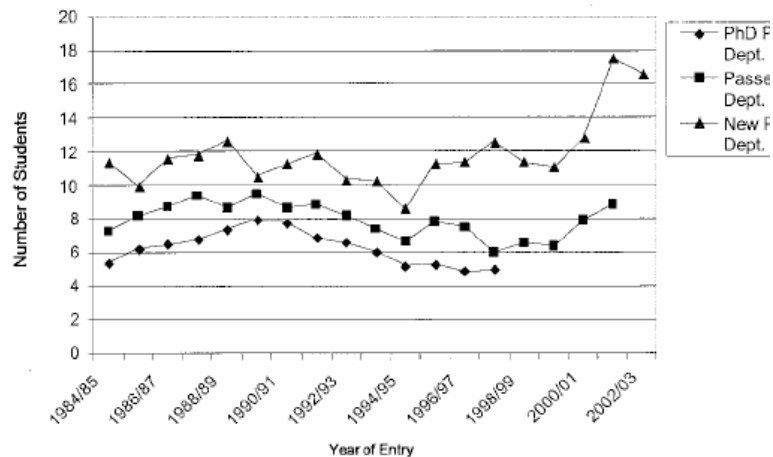
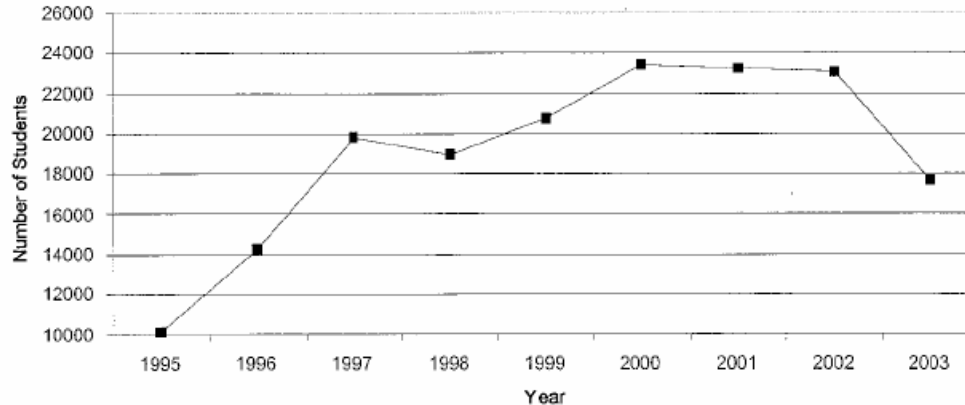


Figure 7. Newly Declared CS/CE Undergraduate Majors



COMPUTING RESEARCH NEWS

A Publication of the Computing Research Association

May 2004

Vol. 16/No. 3

An Overview of Past and Projected Employment Changes in the Professional IT Occupations

By John Sargent



U.S. Department of
Commerce

Professional information technology (IT) occupations have experienced both rapid growth and, most recently, higher-than-average job losses.

Professional IT occupations provided the lion's share of science and engineering job growth during the period 1991-2001. Computer system analysts and scientists and computer programmers together accounted for 79.4 percent of job growth in the science and engineering occupations during this period; if one also adds electrical/electronic engineers (many of whom are IT professionals), the total rises to 93.1

and indirectly—and their importance to U.S. competitiveness, economic growth, and innovation, policymakers have focused attention on understanding this key labor market and the challenges associated with both rapid job growth and recent job losses in these occupations.

Accordingly, since the mid-1990s the U.S. Department of Commerce's Office of Technology Policy (OTP) has conducted extensive analysis of the characteristics of the IT workforce, the dynamics of the IT labor market, the IT education and training landscape, and potential policy implications.² This article presents an overview of OTP's analysis of IT occupational employment changes between 1990 and 2002, as well as OTP's analysis of the Department of Labor's Bureau of Labor Statistics' (BLS) projections for IT occupational growth through 2012. IT

Population Survey (CPS), a product of the U.S. Department of Commerce's Census Bureau and BLS, and 2) the Occupational Employment Statistics (OES) survey, a BLS product.

These surveys used separate and distinct occupational classifications. In addition, the survey methodologies differ significantly; for example, CPS data are acquired through a survey of households, while OES data are derived from a survey of companies. As a result, the CPS and OES surveys arrive at different aggregate numbers for the IT workforce and thus are not directly comparable. Still, both surveys provide insight into the dynamics of the labor market for professional IT workers.

A Decade of Strong Employment Growth

Rapid advances in digital technologies and their widespread deployment throughout the economy fueled explosive growth in the demand for workers skilled in the development and use of information technology. Between 1990 and 2000, CPS data show that the number of jobs in professional-level IT occupations doubled, expanding from 1.2 million to 2.5 million. This translates into an annual growth rate³ of 7.2 percent for these IT occupations, compared with 1.3 percent for all occupations during the same period.

Recent Losses in IT Occupational Employment

The IT occupational employment picture has been quite different since 2000. Between 2000 and 2002, OES

SNOWBIRD 2004



CRA Bulletin

June 3, 2004

- [NSF Funding Outlook Grim But Cyberinfrastructure is a Priority](#)
- [Highlights from the House Science Committee HPC Hearing](#)
- [President Awards CRA-W for Mentoring Efforts](#)
- [Industrial R&D Expenditures Declined in 2002](#)
- [Academic R&D Grows in 2002](#)
- [Academies' Presidents Comment on U.S. Visa Policies](#)
- [CREU Program Accepting Applications](#)
- [Fulbright Scholar Awards 2004-05](#)

[About CRA](#)

[CRA For...](#)

- Faculty
- Students

[Events](#)

<< [Back to CRA Bulletin home page](#)

[Jobs](#)

<< Previous Bulletin ([April 27, 2004](#))

[Gov't Affairs](#)

NSF Funding Outlook Grim But Cyberinfrastructure is a Priority, says NSF Director

National Science Foundation Director Arden Bement met recently with the Coalition for National Science Funding (of which CRA is a member) and warned the science community CNSF represents to lower expectations of increased funding for the agency in the near-term, saying the expectation of budget-doubling, as authorized by Congress and the President in 2002, "isn't reasonable."

For more information: <http://www.cra.org/govaffairs/blog/archives/000084.html>.

[Data &](#)

[Resources](#)

Highlights from the House Science Committee HPC Hearing

In what could fairly be described as a "love in," the recent House Science Committee hearing on HR 4218, the High Performance Computing Revitalization Act of 2004 (HPCRA), featured witnesses from the Administration, industry, university and federal labs all singing the praises of the committee's bill to amend the 1991 High Performance Computing and Communications Act. The Committee's bill attempts to address concerns within the computing community about interagency coordination in the government-wide Networking and Information Technology Research and Development (NITRD) program generally, and specifically within the high-performance computing community. See <http://www.cra.org/govaffairs/blog/archives/000080.html>.

[Membership](#)

[What's New](#)

[Home](#)