The Computing Community Consortium

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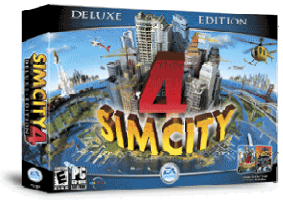
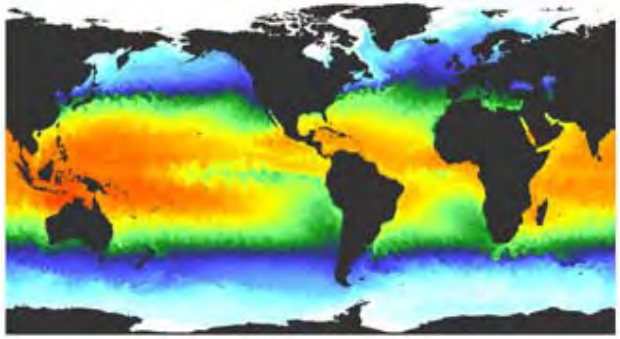
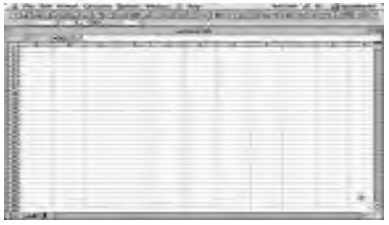
Computing has changed the world

- Advances in computing change the way we live, work, learn, and communicate
- Advances in computing drive advances in nearly all other fields
- Advances in computing power our economy
  - Not just through the growth of the IT industry – through productivity growth across the entire economy

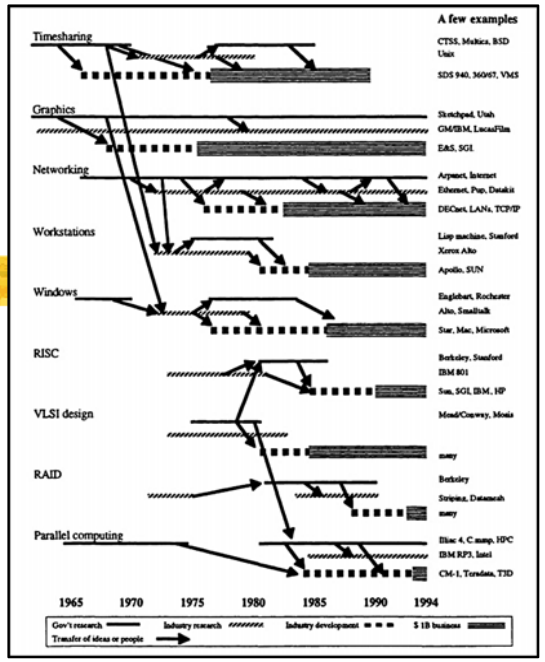




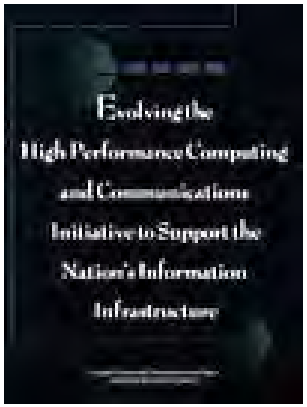



Research has built the foundation

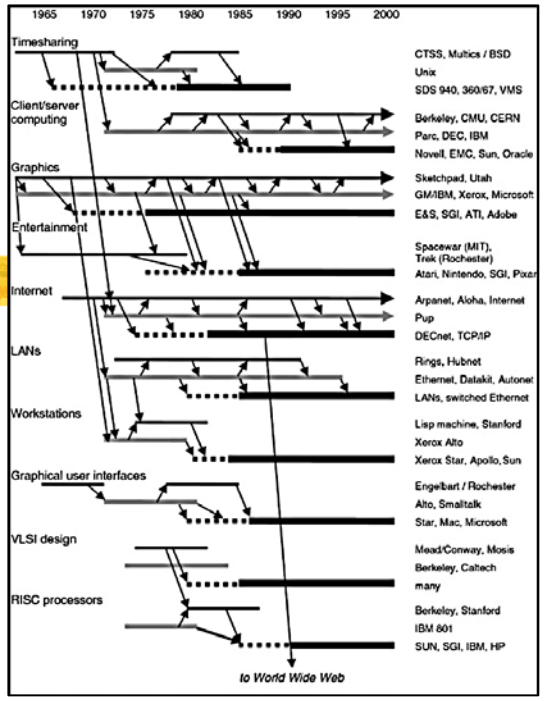


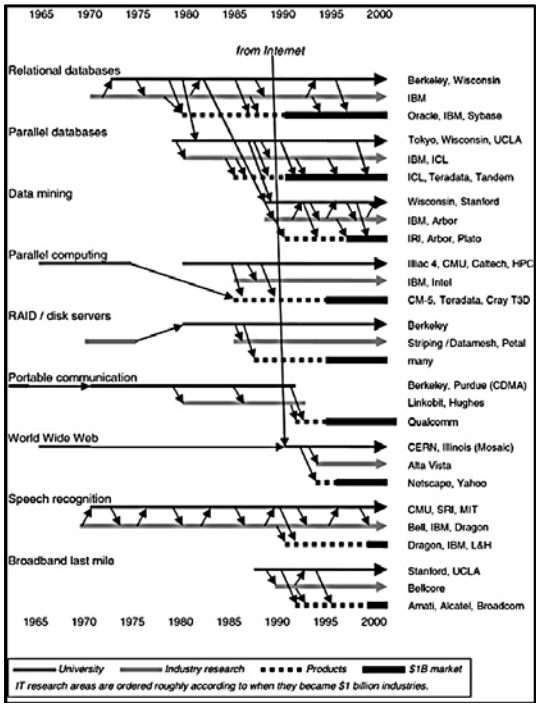
- Timesharing
- Computer graphics
- Networking (LANs and the Internet)
- Personal workstation computing
- Windows and the graphical user interface
- RISC architectures
- Modern integrated circuit design
- RAID storage
- Parallel computing



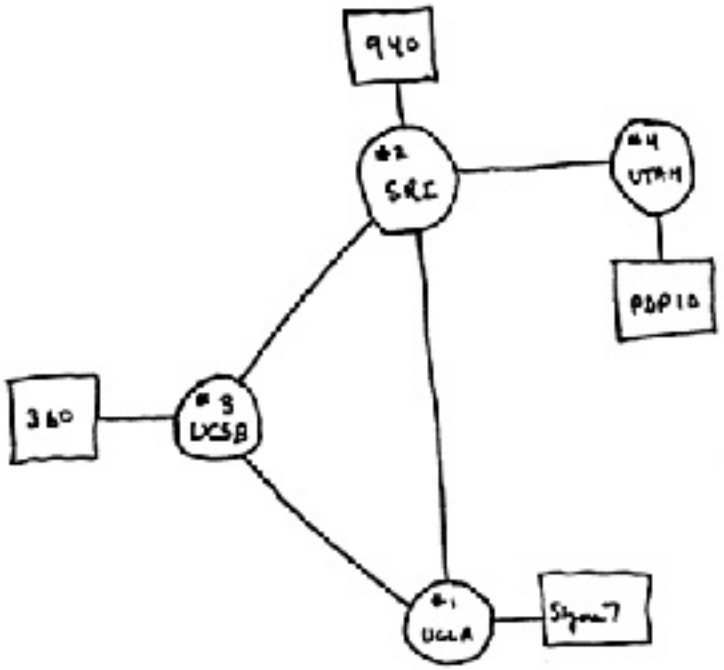
Much of the impact is recent

- Entertainment technology
- Data mining
- Portable communication
- The World Wide Web
- Speech recognition
- Broadband last mile

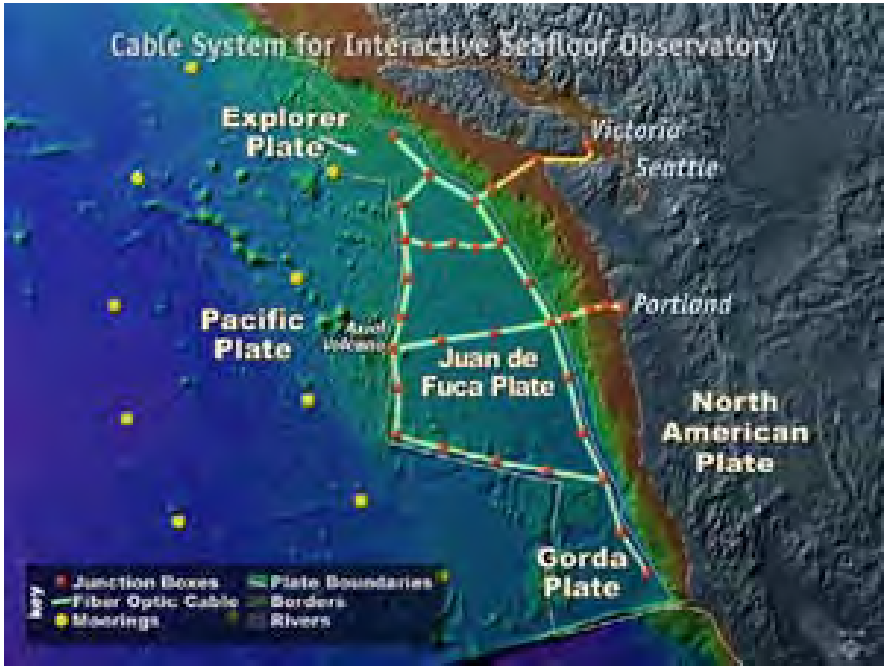




The future is full of opportunity



Designing a new Internet – GENI



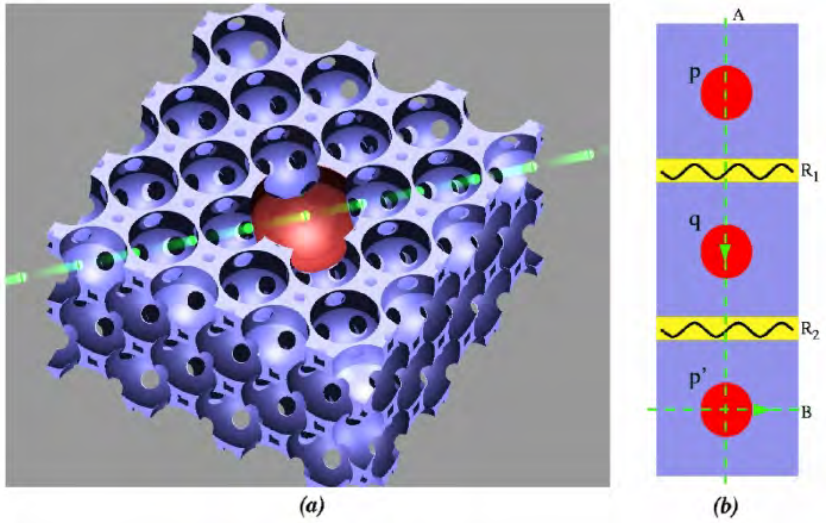
Driving advances in all fields of science and engineering

Wreckless driving

Personalized education

Predictive, preventive, personalized medicine

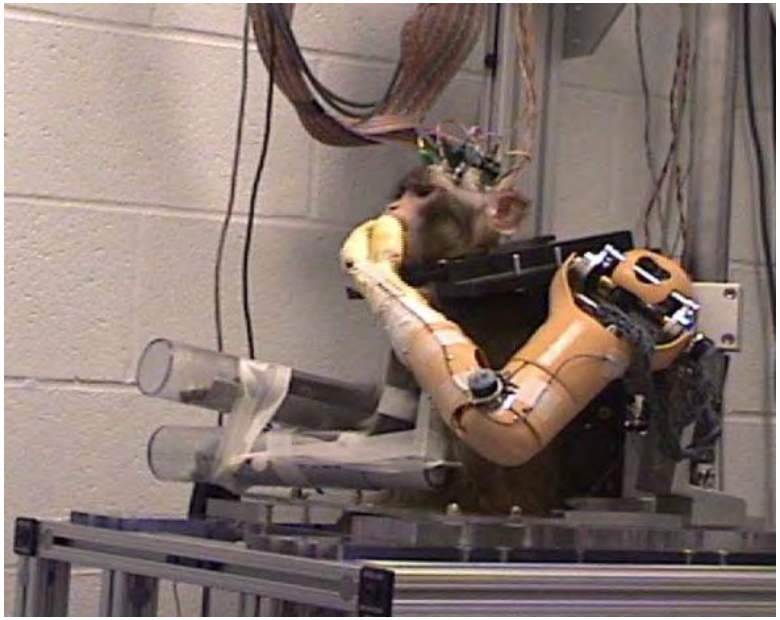
Quantum computing



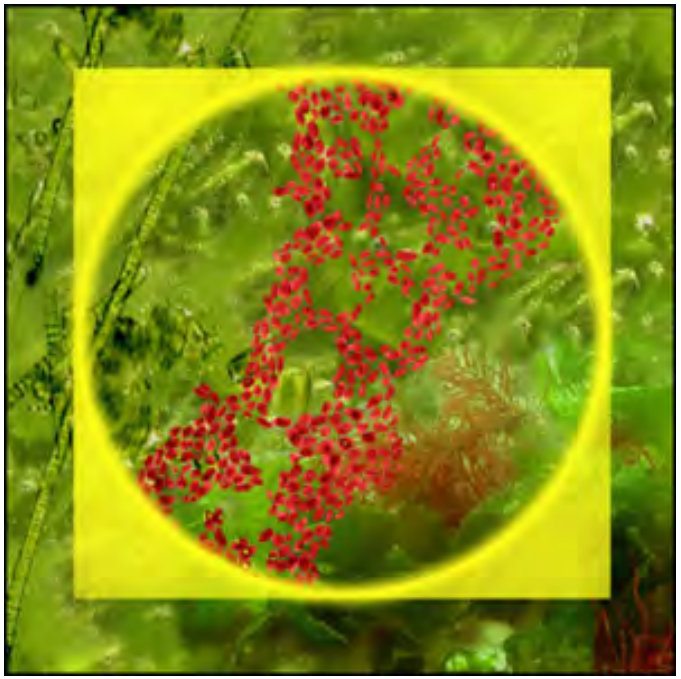
Transforming the
developing world

Personalized health monitoring
-> quality of life

Data-intensive
super computing



Neurobotics



Synthetic biology

The algorithmic lens – Cyber-enabled Discovery and Innovation

We must work together to establish, articulate, and pursue visions for the field

- The challenges that will shape the intellectual future of the field
- The challenges that will catalyze research investment and public support
- The challenges that will attract the best and brightest minds of a new generation

To this end, NSF asked CRA to create the Computing Community Consortium

- To catalyze the computing research community to consider such questions
  - To debate long-range, more audacious research challenges
  - To build momentum around such visions
  - To state them in compelling ways
  - To move them towards funded initiatives
  - To ensure "science oversight" of "at scale" initiatives

The process

- Nucleation – *the germ of a vision, in the minds of a small number of people*
  - CCC can encourage through exemplars
- Broadening and crystallization – *broadening of involvement, and crystallization of the vision*
  - CCC can support study groups
- Program formulation – *work with agency staff to formulate a specific program*
  - CCC can help through knowledge of the process and by creating relationships with federal agency staffs
- Realization – *agency places the program in its budget request*
  - CCC works with initiators to ensure inclusion in budget
- Execution – *do it*

The structure

- CCC is all of us!
  - This process *must* succeed, and it *can't* succeed without broad community engagement
- There is a CCC Council to guide the effort
  - The Council *stimulates* and *facilitates* – it doesn't "own"
  - The Council is in the final stages of creation, through an open process headed by Randy Bryant
    - Seeking diversity of all forms – not just "the usual suspects"
- The Council is led by a Chair
  - Ed Lazowska, University of Washington
  - 50% effort – not titular
- The CCC is staffed by CRA
  - Andy Bernat serves as Executive Director

Activities to date

- Establishment of an overall bootstrapping procedure for the CCC
- Appointment of Interim Council
- Selection of a Council Chair through an open process
  - Nominations broadly solicited from the community
- Selection of an initial permanent Council through an open process
  - Nearly concluded
  - Nominations broadly solicited from the community
  - Attention to diversity of all kinds – organizational, research focus, etc.
  - Council will create subcommittees and task groups that are even more inclusive

- Appointment of the CRA GENI Community Advisory Board
  - Convened an external review of the GENI Research Plan in January
- Selection of an initial permanent GENI Science Council through an open process
  - Succeeds the CRA GCAB
  - Nominations broadly solicited from the community
  - Chaired by Scott Shenker

- Definition an RFP process to support the early stages of the visioning process
  - Will be rolled out at FCRC in June
  - Will aggressively seek broad engagement
    - Through SIGs
    - Through conferences
    - Through outreach to "application areas" (assistive technology, robotics, many more)
- Scheduling of 5 plenary talks at FCRC to introduce CCC and the overall effort to the computing research community
  - Embracing and amplifying efforts that are already underway

Monday June 11, 6-7 p.m., Grand Exhibit Hall

Christos Papadimitriou, UC Berkeley

The Algorithmic Lens: How the Sciences are Being Transformed by the Computational Perspective

Abstract

Tuesday June 12, 6-7 p.m., Grand Exhibit Hall

Bob Colwell, Independent Consultant

Future of Computer Architecture '07

Abstract

Wednesday June 13, 6-7 p.m., Grand Exhibit Hall

Randal Bryant, Carnegie Mellon University

Data-Intensive Super Computing: Taking Google-Style Computing Beyond Web Search

Abstract

Thursday June 14, 6-7 p.m., Grand Exhibit Hall

Scott Shenker, UC Berkeley

We Dream of GENI: Exploring Radical Network Designs

Abstract

Friday June 15, 11:30 a.m. - 12:30 p.m., Grand Exhibit Hall (FCRC Keynote Talk)

Ed Lazowska, University of Washington and Chair, Computing Community Consortium

Computer Science: Past, Present and Future

Abstract

Anticipated interactions

- Close coordination with the CISE AC and CISE leadership
  - CCC is a cooperative agreement, not a grant!
- Engagement with a wide range of other research agencies (e.g., NIH, DARPA, NIST, DoE), leadership groups (e.g., CRA, CSTB, ACM) and research organizations (e.g., industrial research labs, national labs)

The desired result

- Broad community engagement in establishing more audacious and inspiring research visions for our field
  - Some will require significant research infrastructure (e.g., GENI); some will be new programs (e.g., CDI)
- Better public appreciation of the potential of the field
- Attraction of a new generation of students
- Impact!