Perspectives on the IT R&D Ecosystem

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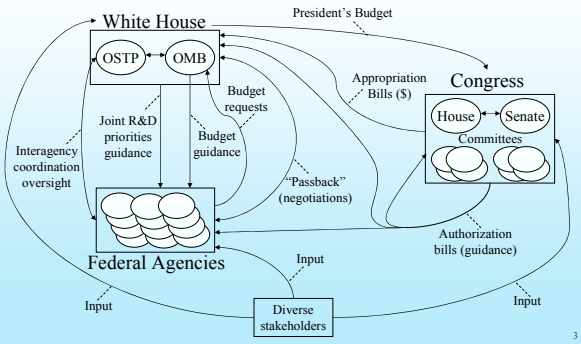
Outline

- Overview of the Federal R&D Funding Process
- NITRD Program Overview
- NITRD Interagency Coordination
- President's Council of Advisors on Science and Technology (PCAST) study on networking and information technology
- Closing Thoughts

Simplified Overview of the Federal R&D Funding Process



Approximate Sequence of Events

- **Executive Branch budget cycle:**
  - Agencies begin preparing budget requests (spring)
  - OMB provides budget guidance to agencies (summer)
  - OMB/OSTP issue joint memorandum on interagency R&D priorities (typically summer)
  - Agencies submit budget requests to OMB (around September)
  - Passback (negotiations between agencies and OMB) starts in late November
  - Budget rollout in early February
- **Legislative Branch budget cycle:**
  - Timing of passing of authorization bills varies, and sometimes does not occur
  - Passing of appropriation bills ideally takes place before the start of a new FY (October 1), but later appropriations are common
- **Interagency coordination of R&D takes place continuously**
- **Input from external stakeholders takes place continuously**

Added Complexities

- **Negotiations within the White House**
- **Negotiations within the House, within the Senate, and conferencing between the House and Senate**
- **Authorization bills have no actual funding attached to them**
- **Appropriations works within construct of jurisdictional boundaries**
- **Influence of special interests can lead to undesirable earmarks**
- **Time lag inherent in budget cycle**
  - FY 2009 budget will be prepared in FY 2007
- **Overlapping budget cycles**
  - Fiscal Year (FY) 2007 involves execution of 2007 activities, rollout of 2008 budget, and planning and preparation of 2009 budget

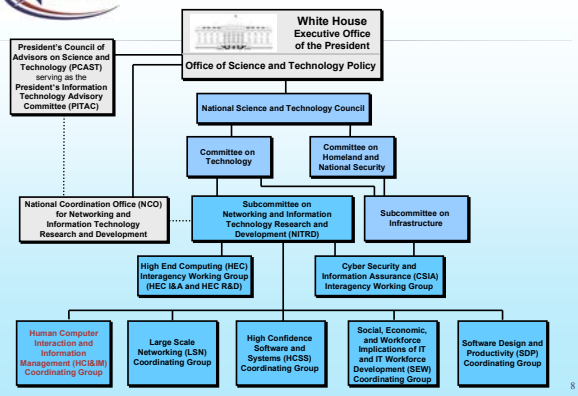
Overview of the NITRD Program

- **Program budget of $3.1 billion proposed for FY 2007**
- **The NITRD Program is organized into technical domains called Program Component Areas (PCAs)**
- **The activities in the PCAs are coordinated through the NITRD Subcommittee of the National Science and Technology Council (NSTC)**
  - Has two Interagency Working Groups (IWGs) and five Coordinating Groups (CGs)
  - Representatives from
    - 14 program member agencies
    - White House Office of Management and Budget (OMB)
    - White House Office of Science and Technology Policy (OSTP)
    - NITRD National Coordination Office

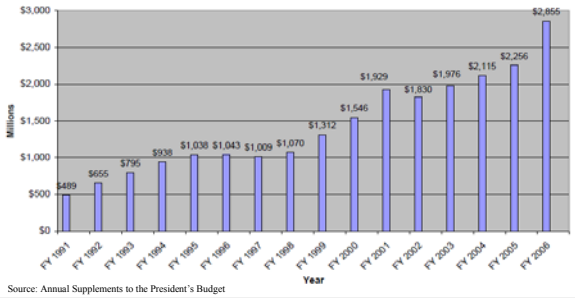
Scope of NITRD Program

- **Program Component Areas (PCAs):**
  - High End Computing Infrastructure and Applications (HEC I&A)
  - High End Computing Research and Development (HEC R&D)
  - Cyber Security and Information Assurance (CSIA)
  - Human-Computer Interaction and Information Management (HCI&IM)
  - Large Scale Networking (LSN)
  - High Confidence Software and Systems (HCSS)
  - Social, Economic and Workforce Implications of IT (SEW)
  - Software Design and Productivity (SDP)
- **Broad participation: R&D conducted by thousands of researchers spanning government laboratories, national laboratories, universities, and private-sector partnerships**
- **Technical Leadership: NITRD efforts shape national R&D agendas**

NITRD Program Coordination Structure



NITRD Program Budget History



Source: Annual Supplements to the President's Budget

NCO/NITRD Objectives

- **The National Coordination Office (NCO) for NITRD supports the Program's multi-agency technical activities.**
- **The NCO's objectives are:**
  - To support NITRD-related policy making in the White House Office of Science and Technology Policy (OSTP)
  - To serve as the Federal focal point for interagency technical planning, budget planning, and coordination for the Federal NITRD Program
  - To serve as a source of timely, high-quality, technically accurate, in-depth information on accomplishments, new directions, and critical challenges relevant to the NITRD Program

PCAST's Charge

- **PCAST assigned responsibilities of the President's Information Technology Advisory Committee (PITAC) (PITAC established under the High-Performance Computing Act of 1991, Public Law 102-194)**
- **This advisory committee shall provide the Director [of the Office of Science and Technology Policy] with an independent assessment of:**

(1) progress made in implementing the [Networking and Information Technology Research and Development (NITRD)] Program;

(2) the need to revise the Program;

(3) the balance between the components of the Program;

(4) whether the research and development undertaken pursuant to the Program is helping to maintain United States leadership in [networking and information] technology; and

(5) other issues identified by the Director.

Progress to Date

- **Established Technical Advisory Group of experts to draw on for additional technical information and expertise**
- **Meeting held with government representatives of the NITRD Program community to solicit information on the NITRD Program and related coordination**
- **Series of meetings held with government, academia and industry, on topics that included each of the NITRD Program Component Areas and other topics (e.g., entrepreneurship and workforce)**
- **Contract in place for developing a snapshot of the global networking and information technology ecosystem**
- **Report completion targeted for Spring 2007**
- **Publicly reported information available via presentations (Sept 12 agenda at http://www.ostp.gov/PCAST/pcast.html)**

Snapshot of the Global Networking and Information Technology Ecosystem

- **Networking and IT R&D does not stand alone—it is a part of a larger ecosystem**
  - Components of this ecosystem include technology transfer, infrastructure, entrepreneurship, a skilled workforce, etc.
- **Baseline data on this ecosystem as it exists today—a snapshot—are needed to provide the proper context to develop PCAST findings and recommendations**
- **Science and Technology Policy Institute (STPI) of the Institute for Defense Analyses selected to prepare the snapshot**
- **Work to date includes definition of components and subcomponents of the ecosystem, metrics, data sources, and data gathering**

Closing Thoughts

- **Diverse influences on objectives of R&D programs**
  - Quest for basic knowledge
  - Desire to improve competitiveness
  - Agency missions
- **Diverse input feeds into prioritization**
  - Agency R&D priorities, interagency priorities, and White House (OMB/OSTP) priorities
  - Federal R&D plans, research agendas, research needs reports
  - External studies and reports (PITAC, PCAST, National Academies, Council on Competitiveness, much more)
- **Technology transfer is one of the keys to impact of IT R&D**
- **Awareness of what the industry is doing is important**
- **The IT R&D ecosystem is a global ecosystem**

Comments or Questions?

- **More detailed information on the NITRD Program is available in the *FY 2007 Supplement to the President's Budget for the NITRD Program***
- **To download a copy of the Budget Supplement or any of our other publications, please visit: http://www.nitrd.gov/**

Backup Slides

NITRD Program Background and Overview

Overview of the NITRD Program

- **Statutory basis for the NITRD Program**
  - High-Performance Computing Act of 1991
  - Next Generation Internet Research Act of 1998
- **One of the few formal interagency R&D efforts – regarded as a successful model of Federal interagency coordination**

Agency NITRD Budgets by PCA

FY 2007 Budget Requests (dollars in millions)

Agency		High End Computing Infrastructure & Applications (HEC I&A)	High End Computing Research & Development (HEC R&D)	Cyber Security & Information Assurance (CSIA)	Human-Computer Interaction & Information Management (HCI &IM)	Large Scale Networking (LSN)	High Confidence Software & Systems (HCSS)	Social, Economic, & Workforce Implications of IT (SEW)	Software Design & Productivity (SDP)	Total
NSF	2006 Estimate	220.3	62.7	57.6	207.4	82.2	41.3	91.1	47.9	810.3
	2007 Request	**272.4**	**64.1**	**67.6**	**220.9**	**84.0**	**61.3**	**92.9**	**50.7**	**903.7**
OSD & DoD Service research orgs.		214.6	9.8	0.6	138.5	141.8	31.2	0.2	6.9	543.7
		186.0	**8.7**	**0.7**	**135.6**	**130.7**	**29.1**	**0.3**	**6.8**	**497.8**
NIH		198.5			188.7	74.9	8.4	12.3	17.9	500.6
		194.7			**183.2**	**74.6**	**8.3**	**12.2**	**17.7**	**490.7**
DARPA			94.1	78.7	174.2	21.3				368.3
			117.7	**81.6**	**233.2**	**33.2**				**465.7**
DOE/SC		104.4	109.1			38.9		3.5		255.8
		138.3	**160.4**			**45.0**		**4.0**		**344.7**
NSA			89.2	14.1		1.0	36.2			140.5
			62.4	**13.3**		**2.3**	**39.9**			**117.9**
NASA		60.3		1.3	2.0	5.7	7.0		1.8	78.1
		63.9		**1.3**	**2.0**	**6.0**	**7.0**		**1.8**	**82.0**
AHRQ					40.1	21.5				61.7
					37.3	**20.0**				**57.3**
NIST		2.3	1.2	9.1	7.8	4.3	9.6		4.6	38.9
		2.3	**1.2**	**11.1**	**9.8**	**4.3**	**9.6**		**4.6**	**42.9**
DOE/NNSA		10.0	15.9			1.6		4.6	3.3	35.4
		9.5	**23.4**			**1.6**		**4.6**	**2.8**	**41.9**
NOAA		11.4	1.9		0.2	0.7			1.6	15.8
		16.4	**1.9**		**0.5**	**2.9**			**1.6**	**23.3**
EPA		3.3			3.0					6.3
		3.3			**3.0**					**6.3**
TOTAL (2006 Estimate)		825.0	383.9	161.3	761.9	393.9	133.6	111.6	84.0	2,855
TOTAL (2007 Request)		**883.8**	**439.9**	**175.5**	**825.4**	**404.5**	**145.2**	**114.0**	**85.9**	**3,074**

NITRD Member Agencies

- Agency for Healthcare Research and Quality (AHRQ)
- Defense Advanced Research Projects Agency (DARPA)
- Department of Homeland Security (DHS)*
- Department of Energy/National Nuclear Security Administration (DOE/NNSA)
- Department of Energy/Office of Science (DOE/SC)
- Environmental Protection Agency (EPA)
- National Archives and Records Administration (NARA)*
- National Aeronautics and Space Administration (NASA)
- National Institutes of Health (NIH)
- National Institute of Standards and Technology (NIST)
- National Oceanic and Atmospheric Administration (NOAA)
- National Security Agency (NSA)
- National Science Foundation (NSF)
- Office of the Secretary of Defense (OSD) and DoD Service Research Organizations

* New to NITRD Program; budget not reported in preceding table

NITRD Participating Agencies

- Central Intelligence Agency (CIA)
- Department of Justice (DOJ)
- Department of State (DOS)
- Department of Transportation (DOT)
- Department of the Treasury (Treas)
- Department of Veterans Affairs (VA)
- Federal Aviation Administration (FAA)
- Food and Drug Administration (FDA)
- General Services Administration (GSA)
- Technical Support Working Group (TSWG)
- United States Geological Survey (USGS)

Collaborative Vision for the NITRD Program

- Increased NITRD interagency R&D coordination and planning activities
- Increased conferences, workshops, and meetings that aid in identifying NITRD needs in strategic areas that are aligned with and benefit Federal missions and national priorities
- Increased NITRD agency interaction and outreach with non-governmental experts to help identify and implement NITRD Program priorities

NITRD Coordination

HEC I&A
HEC R&D
CSIA
HCI&IM
LSN
HCSS
SEW
SDP

- The NITRD Subcommittee coordinates broad goals, policies, and directions for the Program
  - Subcommittee members are senior NITRD agency managers
  - Serves as liaison with White House officials
  - Oversees preparation of annual NITRD Supplement to the President's Budget

NITRD Coordination

HEC I&A
HEC R&D
CSIA
HCI&IM
LSN
HCSS
SEW
SDP

- In each PCA, agency managers participate in an Interagency Working Group (IWG) or a Coordinating Group (CG)
  - IWGs and CGs, co-chaired by agency reps, meet monthly to:
    - Develop joint or multi-agency R&D efforts
    - Exchange information
    - Coordinate R&D plans across agencies to avoid duplication, leverage investments, maximize potential for widely useful results
    - Cooperate on multi-agency workshops, program and grant reviews, development of technical publications
  - Many Federal agencies, not just those in the NITRD Program, participate in IWG and CG activities
  - IWG, CG co-chairs meet as a group to discuss cross-cutting issues