



The Federal Networking and Information Technology Research and Development (NITRD) Program

NICT Forum Briefing

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Information Technology Research and Development**

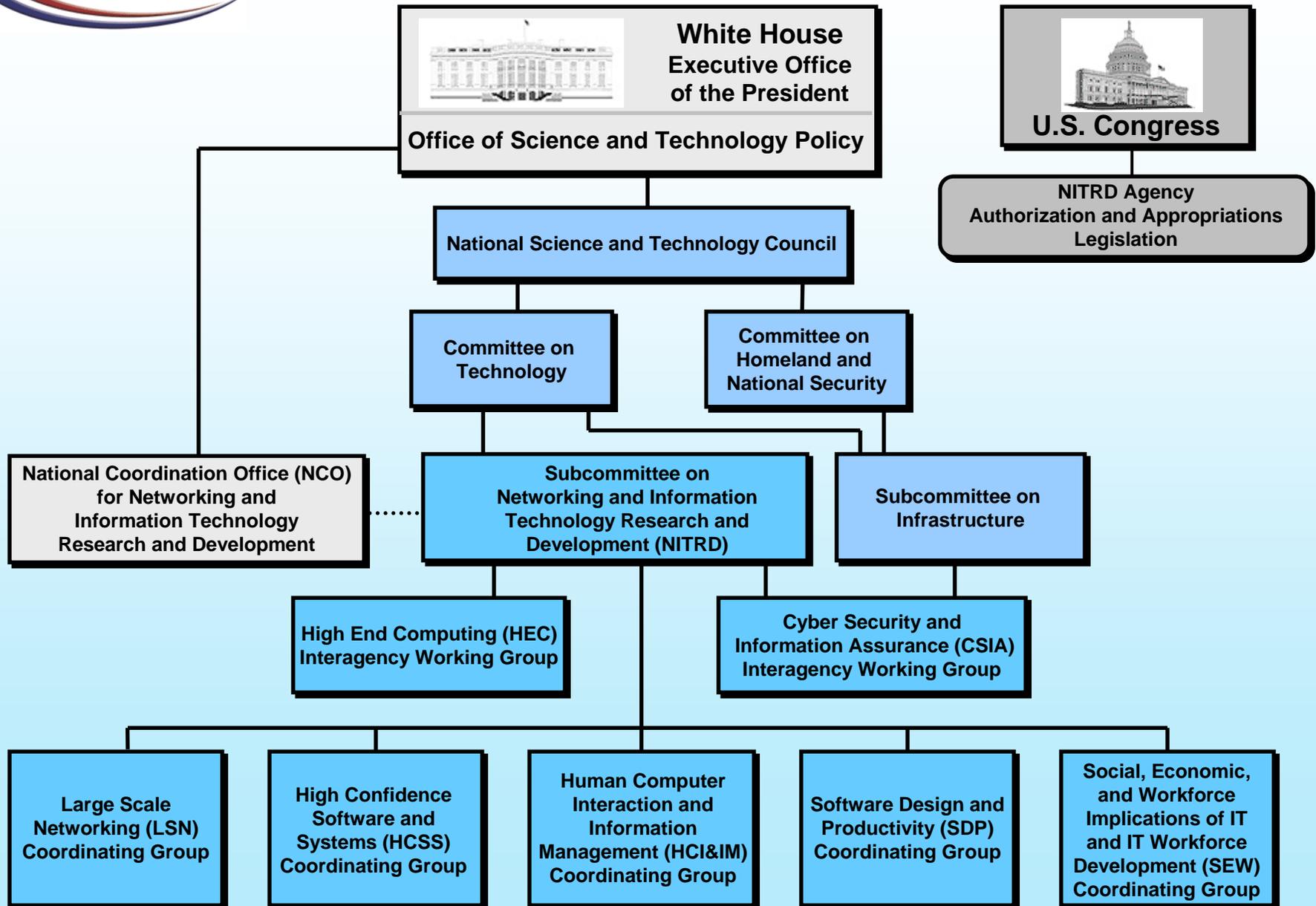


Overview of the NITRD Program

- **Authorization of the Networking and Information Technology Research and Development (NITRD) Program**
 - High-Performance Computing Act of 1991
 - Next Generation Internet Research Act of 1998
- **NITRD Subcommittee, National Science and Technology Council (NSTC)**
 - Representatives from 14 program agencies + OMB + OSTP + NCO/NITRD
 - Has two Interagency Working Groups (IWGs) and five Coordinating Groups (CGs)
- **Budget request of \$3.1 billion in FY 2008**



NITRD Program Coordination





Agency NITRD Budgets by PCA

FY 2008 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 ¹ (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	2007 Request	272.4	64.1	67.6	220.9	84.0	51.3	92.9	50.7	903.7
	2008 Request	303.1	67.1	69.2	225.6	106.7	57.4	109.3	55.3	993.7
OSD and DoD Service Research Orgs. ³		260.4	6.2	23.9	95.2	133.0	43.0		6.7	568.2
		234.1	2.0	23.3	78.7	137.8	31.5		4.3	511.8
NIH		194.7			183.2	74.6	8.3	12.2	17.7	490.7
		131.7	1.8	1.2	194.5	65.4	8.2	11.9	2.9	417.6
DARPA ³			89.6	93.4	198.6	38.2				419.9
			68.9	96.9	204.3	42.4				412.5
DOE/SC		135.3	160.4			45.0		4.0		344.7
		250.5	67.0			47.3		5.0		369.8
NSA ³			36.4	15.8		1.1	22.1			75.4
			60.3	15.8		1.4	25.2			102.6
NASA		63.9		1.3	2.0	6.0	7.0		1.8	82.0
		69.2		0.3	8.0	3.1	2.0		2.0	84.6
NIST		2.4	1.3	11.1	7.8	5.3	17.5		5.0	50.4
		2.4	1.3	11.1	7.8	5.3	17.5		5.0	50.4
AHRQ					44.9	5.0				49.9
					39.8	5.0				44.8
DOE/NNSA		9.5	23.4			1.6		4.6	4.7	43.8
		9.8	17.8			1.5		4.7		33.8
NOAA		16.4	1.9		0.5	2.9			1.6	23.3
		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
NARA					3.5					3.5
					4.5					4.5
TOTAL (2007 Request) ³		958.2	383.4	213.0	759.5	396.7	149.1	113.7	88.2	3,062
TOTAL (2008 Request)		1,020.5	288.0	217.7	766.7	418.8	141.9	130.9	71.2	3,056



NITRD NCO Objectives

- **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**
- **To augment the impact of information technology R&D as a transforming force for societal and economic good**



Administration Priorities in the NITRD Program

- **Over the last three years, the Analytical Perspectives chapter of the President's Budget has emphasized three areas in the NITRD Program:**
 - High-End Computing: Implementation of the *Federal Plan for High-End Computing R&D*
 - Advanced Networking: Calls for the development of a *Federal Plan for Advanced Networking R&D*
 - Cyber Security and Information Assurance: Implementation of the *Federal Plan for Cyber Security and Information Assurance R&D*, including roadmapping activities
- **The Joint R&D Priorities memo from OSTP/OMB to Agency heads reiterates these priorities for the NITRD Program**
- **The American Competitiveness Initiative (ACI) emphasizes increasing funding for basic research in the physical sciences**
 - *NITRD research areas are included in the ACI*



NCO Impact on NITRD Program Activities

- **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 national priorities**
- **Increased NITRD agency interaction and outreach with non-governmental experts to help identify and implement NITRD Program priorities**



Role of the NCO in NITRD Program Activities

- **The NCO helps the Interagency Working Groups and Coordinating Groups identify research needs, and plan, budget, and assess progress in addressing those needs**
- **Programs and activities take place at two levels:**
 - Government-only: interagency meetings
 - With external stakeholders: conferences and workshops involving academia and industry
- **Information dissemination takes place through published reports including:**
 - Annual Supplements to the President's Budget
 - Research needs reports
 - Conference and workshop reports
 - Reports of the President's Information Technology Advisory Committee (PITAC)



Program Component Areas (PCAs)

At the core of the NITRD Program structure are eight technical domains called Program Component Areas (PCAs):

- **High-end Computing (HEC) Interagency Working Group (IWG), with two PCAs:**
 - HEC Infrastructure and Applications (I&A) – R&D to extend the state-of-the-art in computing systems, applications, and infrastructure
 - HEC Research and Development (R&D) – R&D to optimize the performance of today's high-end computing systems and to develop future generations of high-end computing systems
- **Cyber Security and Information Assurance (CSIA) Interagency Working Group (IWG):**
 - R&D to protect computer-based systems from actions that compromise or threaten to compromise the authentication, availability, integrity, or confidentiality of these systems. and/or the information they contain



PCAs (continued)

- **Human Computer Interaction and Information Management (HCI&IM):**
 - By focusing on information interaction, integration, and management, R&D to develop and measure the performance of new technologies, agents, cognitive systems, and information systems that support the hierarchy and refinement of data from discovery to decision and action by both humans and computers working together and separately
- **Large Scale Networking (LSN):**
 - R&D to develop leading-edge networking technologies, services, and enhanced performance, including programs in new networking architectures, optical network testbeds, infrastructure, middleware, end-to-end performance measurement, and advanced components; grid and collaboration networking tools and services; and engineering, management, and use of large-scale networks for scientific and applications R&D; and network security applied to R&D networks, applications, and infrastructure



PCAs (continued)

- **High Confidence Software and Systems (HCSS):**
 - R&D to enable the routine production of reliable, safe, and certifiably dependable systems by developing robust scientific foundations and technology for innovative systems design, systems and embedded application software, and assurance and verification
- **Social, Economic, and Workforce Implications of IT and IT Workforce Development (SEW):**
 - R&D to study the co-evolution of IT and social and economic systems; develop the IT workforce, and develop innovative IT applications in education and training
- **Software Design and Productivity (SDP):**
 - R&D to advance concepts, methods, techniques, and tools that improve software design, development, and maintenance to produce more usable, dependable and cost-effective software-based systems



Recent Highlights of the NCO/NITRD

- Recently released the FY 2008 *Interim* Supplement to the President's Budget for the NITRD Program
- Fully integrated CSIA as a NITRD PCA, and the CSIA IWG as a NITRD group
- Department of Homeland Security and the National Archives and Records Administration recently joined the NITRD Program
- **Recent workshops (held in 2006):**
 - *Interoperability of Software*, Denver, CO (June)
 - *EU-US Embedded Systems Workshop*, Helsinki (June)
 - ***Optical Networking Testbed 3*, Tokyo (jointly sponsored with NICT) (September)**
 - *Information Integration*, Philadelphia, PA (October)
 - *Aviation Software Systems for the 2nd Century of Flight: Design for Certifiably Dependable Systems*, Alexandria, VA (October)
 - *Beyond SCADA – Cyber-Physical Systems*, Pittsburgh, PA, November
 - *High-Confidence Software Platforms for Cyber-Physical Systems*, Alexandria, VA (November-December)



Highlights of Ongoing NCO/NITRD Activities

- **Nearing completion of a National Academies study on the impact of computational science (report expected in mid-to late-2007)**
- **Supporting development of a roadmap for CSIA R&D, as called for in the Federal Plan for Cyber Security and Information Assurance R&D**
- **Supporting development of a Federal Plan for Advanced Networking R&D as requested by OSTP**
- **Future workshops (tentative):**
 - High-Confidence Medical Devices, Software, and Systems (June)
 - High-Confidence Real-Time Operating Systems (July)
 - Optical Networking Technology (August)
 - Cyber Security and Information Assurance R&D Roadmap (late Summer)



PITAC-Related Highlights of the NCO/NITRD

- **The NCO supports the President's Information Technology Advisory Committee (PITAC), whose responsibilities have now been assigned to the President's Council of Advisors on Science and Technology (PCAST)**
- **The previous PITAC released the following reports:**
 - *Computational Science: Ensuring America's Competitiveness*
 - *Cyber Security: A Crisis of Prioritization*
 - *Revolutionizing Health Care Through Information Technology*
- **PCAST, as the new PITAC, is conducting a high-level review of the NITRD Program**
 - New members were added to support PCAST in their IT advisory capacity
 - PCAST Networking and IT (NIT) Subcommittee established, co-chaired by PCAST members George Scalise and Dan Reed
 - A Technical Advisory Group (TAG) to the PCAST for NIT from academia and industry is providing expert opinion upon request
 - Initial draft of the Subcommittee's report expected to be presented at April 2007 PCAST meeting



Questions?

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