

**U.S. HOUSE OF REPRESENTATIVES
COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY
RESEARCH AND TECHNOLOGY SUBCOMMITTEE**

HEARING CHARTER

*A Review of the Networking and Information Technology
Research and Development (NITRD) Program*

**Wednesday, October 28, 2015
10:00 a.m. – 12:00 p.m.
2318 Rayburn House Office Building**

Purpose

On Wednesday, October 28, 2015, the Subcommittee on Research and Technology will hold a hearing to discuss the Networking and Information Technology Research and Development (NITRD) program, a crosscutting, multi-agency effort to coordinate federal research and development (R&D) funding for “revolutionary breakthroughs in advanced information technologies such as computing, networking, and software.”¹ The cross-agency budget request for NITRD is \$4.09 billion in FY2016.² The hearing will also discuss the recent President’s Council of Advisors on Science and Technology’s report on the NITRD program published in August 2015.

Witnesses

- Dr. Keith Marzullo, Director, National Coordination Office, The Networking and Information Technology Research and Development Program
- Dr. Gregory D. Hager, Mandell Bellmore Professor, Department of Computer Science, Johns Hopkins University; Co-Chair, NITRD Working Group, The President’s Council of Advisors on Science and Technology
- Dr. Edward Seidel, Director, National Center for Supercomputing Applications, University of Illinois at Urbana-Champaign

OVERVIEW

The United States has been a world leader in networking and information technology (NIT). Federal support for research and development (R&D) in NIT originally stemmed from an interest in and the challenge of developing computers capable of addressing complex problems, primarily those focused on national security and high-end applications. Over the past few decades, federal spending for NIT R&D has encompassed a broad array of technologies, from digital libraries to cloud computing. The eventual commercial applications for such federally-funded R&D have fundamentally changed the way modern-day Americans work and live.

¹See: https://www.nitrd.gov/about/about_nitrd.aspx.

²See: <https://www.nitrd.gov/PUBS/2016supplement/FY2016NITRDSupplement-Investments.pdf>.

Additionally, R&D in NIT provides a greater understanding of how to protect essential systems and networks that support fundamental sectors of our economy, from emergency communications and power grids to air-traffic control networks and national defense systems. NIT R&D works to prevent or minimize disruptions to critical information infrastructure, to protect public and private services, to detect and respond to threats while mitigating the severity of and assisting in the recovery from those threats.

THE NITRD PROGRAM

Background and Overview

The High Performance Computing Act of 1991 (P.L. 102-194) authorized the precursor of the NITRD program, then called the High Performance Computing and Communications program, to accelerate progress in the advancement of computing and networking technologies and to support leading edge computational research in a range of science and engineering fields.

The name of the program has since evolved to the Networking and Information Technology Research and Development (NITRD) program, and as required by the High-Performance Computing Act of 1991 (P.L. 102-194), the Next Generation Internet Research Act of 1998 (P.L. 105-305), and the America COMPETES (Creating Opportunities to Meaningfully Promote Excellence in Technology, Education, and Science) Act of 2007 (P.L. 110-69), the NITRD program provides a framework and mechanisms for coordination among the Federal agencies that support advanced information technology (IT) R&D and report IT research budgets across the federal budget.³

The NITRD program is the main source of federally funded work on advanced information technologies in networking, computing, and software, totaling an estimated \$4.0 billion in FY2015 (with the National Science Foundation being the principal contributor with over \$1.1 billion of that total). The NITRD program supports a number of research areas through its interagency coordination, including big data, cyber physical systems, cybersecurity, health technology, high performance computing, and large scale networking.⁴

The National Coordinating Office

The National Coordinating Office (NCO) was established in September 1992, and it supports the planning, coordination, budget, and assessment activities of the NITRD program.⁵ In addition, the NCO supports the National Science and Technology Council's Subcommittee on NITRD (the NITRD Subcommittee), which provides policy, program, and budget planning guidance for the NITRD Program and is composed of representatives from each of the participating agencies, OSTP, Office of Management and Budget (OMB), and the NCO.⁶ The

³ Supplement to the President's Budget: FY 2016, The Networking and Information Technology Research and Development Program, February 2015, available at:

<https://www.nitrd.gov/pubs/2016supplement/FY2016NITRDSupplement.pdf>

⁴ Ibid.

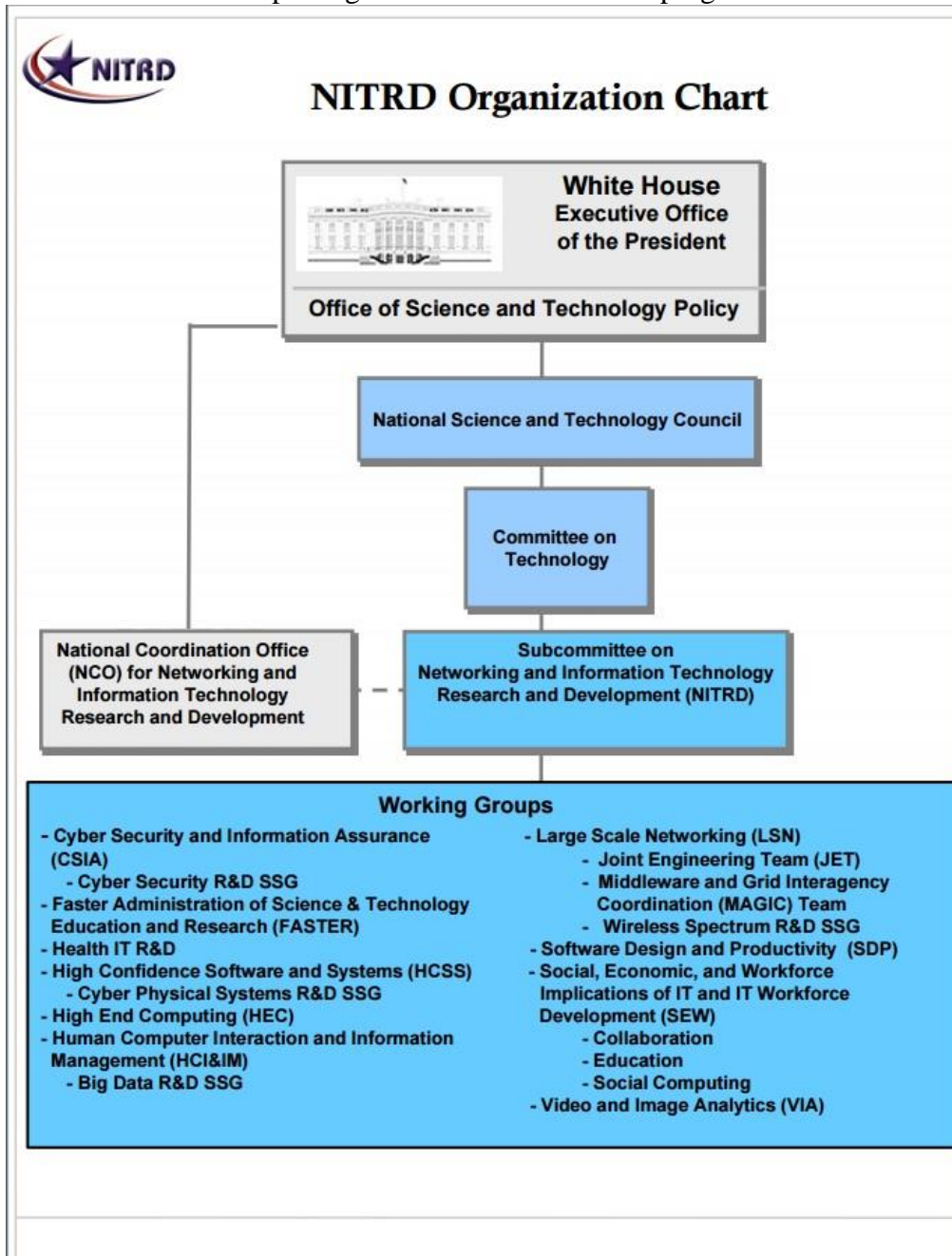
⁵ Moloney Figliola, Patricia, "The Federal Networking and Information Technology Research and Development Program: Background, Funding, and Activities," Congressional Research Service, August 3, 2015, available at:

<http://www.crs.gov/reports/pdf/RL33586>

⁶ Ibid.

director of the NCO is appointed by and reports to the Office of Science and Technology Policy (OSTP) director.

An overview of the reporting structure of the NITRD program:



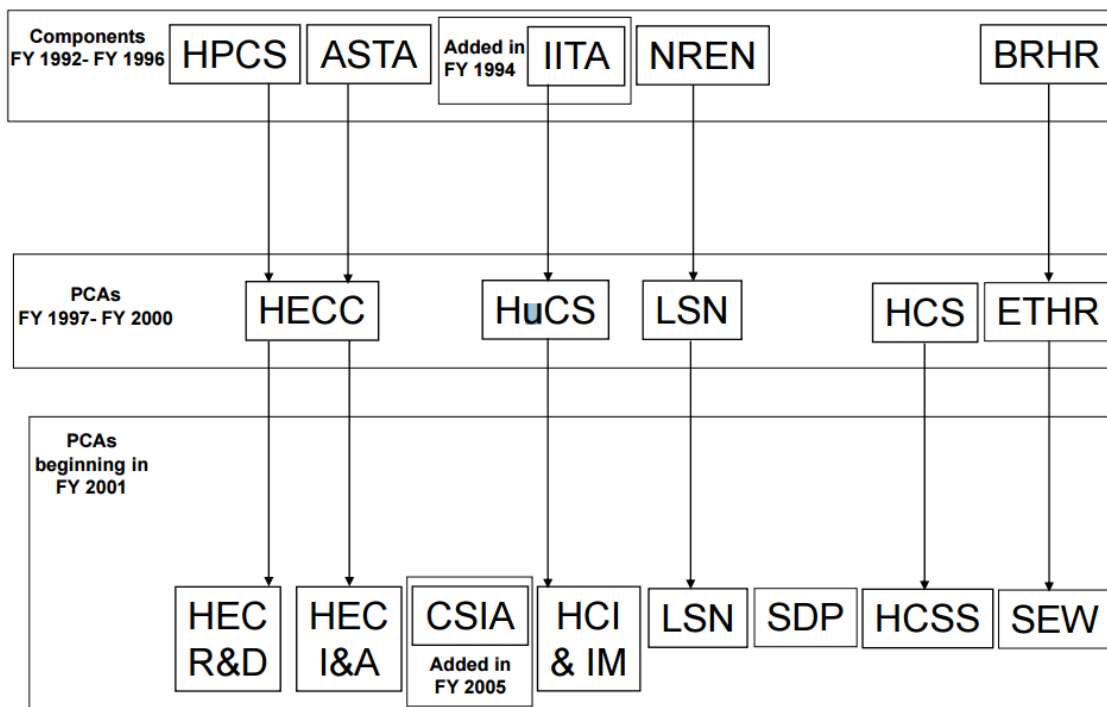
Source: NITRD Organization Chart, NITRD Program, available at: https://www.nitrd.gov/subcommittee/NITRD_Org_Chart.pdf

Assessment of NITRD by the President’s Council of Advisors on Science and Technology (PCAST)

Executive Order 13539 assigned the President’s Council of Advisors on Science and Technology (PCAST) to periodically review the NITRD program. This past August, PCAST completed its most recent assessment of NITRD and issued a report to the President and Congress, “Ensuring Leadership in Federally Funded Research and Development in Information Technology,” which calls for “a refreshed R&D investment portfolio and coordination process given the pressing concerns of the IT ecosystem.”⁷

The PCAST report focuses on eight specific R&D areas including: cybersecurity, IT and health, big data and data-intensive computing, IT and the physical world, privacy protection, cyber-human systems, high capability computing, and foundational computing research. Since many of the Program Component Areas (PCAs) have gone largely unchanged since the mid-1990s, the report also calls for a modernized set of categories for IT R&D spending, and suggests updating those categories every five to six years.⁸

History of NITRD PCAs



February 2012

See Table 1 for Acronym Expansion

⁷ “Ensuring Leadership in Federally Funded Research and Development in Information Technology,” President’s Council of Advisors on Science and Technology, August 2015, available at: https://www.whitehouse.gov/sites/default/files/microsites/ostp/PCAST/nitrd_report_aug_2015.pdf

⁸ Ibid.

Table 1 Acronym Expansion

ASTA— Advanced Software Technology and Algorithms	HEC R&D— High End Computing Research and Development
BRHR— Basic Research and Human Resources	HPCS —High Performance Computing Systems
CSIA— Cyber Security and Information Assurance	HuCS— Human Centered Systems
ETHR — Education, Training, and Human Resources	IITA —Information Infrastructure Technology and Applications
HCI & IM — Human Computer Interaction and Information Management	LSN — Large Scale Networking
HCS — High Confidence Systems	NREN — National Research and Education Network
HCSS — High Confidence Software and Systems	PCA— Program Component Area
HECC— High End Computing and Computation	SDP — Software Design and Productivity
HEC I&A— High End Computing Infrastructure and Applications	SEW— Social, Economic, and Workforce Implications of IT and IT Workforce Development

February 2012

Source: History of NITRD PCAs, NITRD Program, available at: https://www.nitrd.gov/about/about_nitrd/nitrd_history/new-pca-names.pdf

To read the report and its recommendations in its entirety, please see: “Ensuring Leadership in Federally Funded Research and Development in Information Technology,” President’s Council of Advisors on Science and Technology, August 2015, available at: https://www.whitehouse.gov/sites/default/files/microsites/ostp/PCAST/nitrd_report_aug_2015.pdf