

About the National Coordination Office for NITRD

The NCO provides overall support for the planning, budget, and assessment activities of the NITRD Program, including the work of the NITRD Subcommittee, IWGs, and CGs. The NCO, reporting to OSTP, also provides technical support for certain activities of the President's Council of Advisors on Science and Technology (PCAST), which is charged with assessing the NITRD Program.

As the hub of NITRD interagency coordination, the NCO informs wider audiences about the Program and the evolving R&D challenges in advanced information technologies. The NCO prepares, publishes, and disseminates NITRD reports, Federal R&D plans, reports of the PCAST, and related materials. The NCO also maintains the NITRD Web site, where information about the Program and electronic versions of NITRD documents are available – see www.nitrd.gov.

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AHRQ – Agency for Healthcare Research and Quality
DARPA – Defense Advanced Research Projects Agency
DHS – Department of Homeland Security
DOE/NNSA – Department of Energy/National Nuclear Security Administration
DOE/SC – Department of Energy/Office of Science
EPA – Environmental Protection Agency
NARA – National Archives and Records Administration
NASA – National Aeronautics and Space Administration

NIH – National Institutes of Health
NIST – National Institute of Standards and Technology
NOAA – National Oceanic and Atmospheric Administration
NSA – National Security Agency
NSF – National Science Foundation
OSD and DoD Service research organizations – Office of the Secretary of Defense and DoD Service research organizations

NITRD Program Strategic Goals

The NITRD Program is authorized by Congress through the High-Performance Computing Act of 1991 (Public Law 102-194), the Next Generation Internet Research Act of 1998 (Public Law 105-305), and the America COMPETES Act of 2007 (Public Law 110-69). The Program's strategic goals are to:

- Provide R&D foundations for assuring continued U.S. technological leadership in advanced networking, computing systems, software, and associated information technologies
- Provide R&D foundations for meeting the needs of the Federal government for advanced networking, computing systems, software, and associated information technologies
- Accelerate development and deployment of these technologies in order to maintain world leadership in science and engineering; enhance national defense and national and homeland security; improve U.S. productivity and competitiveness and promote long-term economic growth; improve the health of the U.S. citizenry; protect the environment; improve education, training, and lifelong learning; and improve the quality of life



Federal agencies working together to develop a broad spectrum of advanced IT capabilities to power Federal missions, U.S. science, engineering, and technology leadership, and U.S. economic competitiveness

The U.S. Government's Networking and Information Technology Research and Development Program

High End Computing – Systems, Software, Infrastructure, Applications
Cyber Security
Information Assurance
Human-Computer Interaction
Information Management
Large Scale Networking
High Confidence Software and Systems
Social, Economic, and Workforce Implications of IT
IT Workforce Development
Software Design and Productivity



Since the dawn of the information age, the U.S. government's long-term R&D investments in networking and information technology (IT) have been generating revolutionary breakthroughs – such as the technical architecture enabling the Internet, supercomputing, the computer mouse, the Web browser, and the search engine – that not only support critical Federal missions but drive U.S. scientific and technological innovation and economic competitiveness.

Today, that Federal leadership continues in the Networking and Information Technology Research and Development (NITRD) Program. A unique collaborative enterprise of many Federal agencies, the \$4.3 billion (President's 2011 Budget) NITRD Program is the main Federal R&D investment portfolio in networking, computing, software, cyber security, and related information technologies. NITRD is one of the few formal interagency R&D activities within the Government and is viewed as a model of interagency coordination and cooperation.

How the NITRD Program Works

Collaboration

The NITRD agencies work together in eight major research areas – called Program Component Areas (PCAs). In each PCA, agency program managers participate in an Interagency Working Group (IWG) or Coordinating Group (CG) that coordinates R&D activities such as multi-agency R&D efforts; budget and program planning; conferences, workshops, and seminars; technical reports and white papers; and preparation of the annual Supplement to the President's Budget for the NITRD Program.

Broad Scope

NITRD PCAs, groups, and diversified R&D interests include:

High End Computing Infrastructure and Applications (HEC I&A) – R&D to extend the state of the art in high-end computing systems, infrastructure supporting those systems, and advanced applications.

High End Computing Research and Development (HEC R&D) – R&D to optimize the development and performance of future generations of high-end systems.

Cyber Security and Information Assurance (CSIA) – 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. Development of game-changing security strategies to achieve national-level impact by the Senior Steering Group (SSG) for Cyber Security R&D.

Human Computer Interaction and Information Management (HCI&IM) – R&D to expand human capabilities and knowledge through information use and management by computer systems and humans working with information technologies.

Large Scale Networking (LSN) – R&D to extend the state of the art in networking architectures, technologies, services, security, applications, and enhanced performance.

Software Design and Productivity (SDP) – R&D to advance software engineering concepts, methods, techniques, and tools that result in more usable, dependable, cost-effective, and sustainable software-intensive systems.

High Confidence Software and Systems (HCSS) – R&D to advance science enabling the routine production of

certifiably dependable, safe, and secure complex computing and cyber-physical systems (IT-enabled engineered systems).

Social, Economic, and Workforce Implications of IT, and IT Workforce Development (SEW) – R&D to advance the science of socio-technical systems, including understanding the co-evolution of IT and social and economic systems; develop the workforce of the 21st century; and develop innovative IT applications in education and training.

Faster Administration of Science and Technology Education and Research (FASTER) Community of Practice (CoP)– Federal agency CIOs group that works to accelerate agencies' adoption of advanced IT capabilities developed in Government-sponsored IT research.

National Visibility

Federal agencies' NITRD investments are supporting key Administration priorities such as national defense and security, health-care modernization, clean energy technologies and renewable energy sources, cyber and critical infrastructure security, education, economic revitalization and innovation, and U.S. science and engineering leadership. The Program is coordinated by the Subcommittee on Networking and Information Technology Research and Development, under the aegis of the National Science and Technology Council.

Members of the NITRD Subcommittee include senior NITRD agency managers and representatives of the White House Office of Science and Technology Policy (OSTP), the Office of Management and Budget (OMB), and the National Coordination Office (NCO) for Networking and Information Technology Research and Development. The NITRD Subcommittee is co-chaired by the Director of the NCO and an agency representative from one of the NITRD Program member agencies.

Technology Leadership

NITRD activities and reports help shape national R&D agendas in critical areas, such as supercomputing, optical networking, cyber security and information assurance, cyber-physical systems, information integration and management, and socioeconomic impacts of emerging technologies. The R&D funded by NITRD agencies helps support the education and training of the Nation's new generations of IT researchers.

Technology Results with Societal Impact

Federal NITRD investments have produced a long list of R&D breakthroughs – TCP/IP, ARPAnet, the graphical user interface, reduced instruction set computer (RISC) architectures, redundant array of independent disks (RAID) storage technology, the domain name system (DNS), cluster computing, processor-in-memory (PIM), field-programmable gate arrays (FPGAs), the Lightweight Directory Access Protocol (LDAP), and mobile and hybrid networking, to name only a few. The NITRD enterprise generates multidisciplinary innovations reflecting technical contributions from multiple agencies. Some examples:

- Computational decoding of the human genome, launching a new era of gene-based medical science
- Modeling and simulation of complex physical systems, such as aircraft, automobiles, power grids, and pharmaceuticals
- Visualization technologies in science, engineering, and medicine
- Near-real-time weather forecasts
- Climate models that are increasing human understanding of global climate change
- Pervasive mobile networking
- Unmanned aerial vehicles, search-and-rescue robots
- Collaborative distributed work environments
- Open digital libraries of fundamental knowledge in the sciences, mathematics, engineering, social sciences, and humanities
- Devices for assisted living
- Computer-based education and training

Selected NITRD Publications

