

**Section by Section Analysis
HR 3834**

Advancing America's Networking and IT Research and Development Act of 2012

Text in Blue indicates provisions not included in the NITRD Act of 2009 (H.R. 2020)

“To amend the HPC Computing Act of 1991 to authorize activities for support of networking and information technology research, and for other purposes.”

Sec. 1 - Short Title

Advancing America's Networking and Information Technology Research and Development Act of 2012

Sec. 2 - Program Planning and Coordination

(a) Adds a requirement for a “periodic review” to assess the contents and funding levels of the PCAs, restructure the program when warranted, and ensure that the program includes “large-scale, long-term, interdisciplinary R&D,” including research in a new area described below (Sec. 3. Large-scale Research in Areas of National Importance).

(b) Adds a requirement that the participating agencies develop a 5-year strategic plan within 12 months of passage of the act and updated every 3 years thereafter. The strategic plan will specify short and long-term objectives for the program, anticipated time to achieve the near-term objectives, metrics to be used. In addition, the plan will describe how the program will:

- foster the transfer of R&D results into new tech, applications for the benefit of society, and tech transfer initiatives of the states;
- encourage interdisciplinary R&D in NIT, including collaborations across agencies, across PCAs, with industry, Federal labs, and international organizations;
- address long-term challenges of “national importance” which require large-scale, long-term, interdisciplinary R&D;
- place emphasis on high-risk, high-return projects;
- strengthen all levels of NIT education and training to ensure an adequate workforce;
- **attract more women and underrepresented minorities to pursue postsecondary degrees in NIT.**

The strategic plan will also include milestones and roadmaps for “establishing and maintaining the national research infrastructure required to support the program. The plan should also take into consideration the recommendations of the President’s Advisory Committee, and stakeholders identified by the National Coordinating Office.

The Director on NCO will transmit the strategic plan to the relevant House and Senate committees.

(c) Adds “education” to the areas of responsibility in the program for which the Director of NCO shall establish the goals and priorities (joining high-performance computing research, development, networking and other activities).

Adds a responsibility for the NCO Director to encourage and monitor the efforts of the agencies participating in NITRD allocating resources to ensure that the strategic plan is developed and executed effectively, and that the objectives of the program are met.

(d) Adds a requirement that co-chairs of the President’s advisory committee must meet the qualifications for committee membership (non-Federal who are “specially qualified” to provide the Director with advice and information on HPC) and **may** (was shall) be members of PCAST.

(e) Requires the NCO’s annual report on the program include funding levels for the previous fiscal year, and adds research areas supported in Sec 104 to the PCA funding levels that must be reported.

Adds a requirement that the annual report describe how the objectives of each PCA, and of cross-cutting activities relate to the objectives of the strategic plan. Also requires that the plan detail the funding required for the NCO to fulfill its functions described in an amended Sec 102 (described below in Sec 6).

(f) Adds a definition for “cyber physical systems” as “physical or engineered systems whose networking and information technology functions and physical elements are deeply integrated and are actively connected to the physical world through sensors, actuators, or other means to perform monitoring and control functions.”

Strikes “high-performance computing” and substitutes “networking and information technology” for this definition: “means advanced computing, communications and information technologies, including (strikes “supercomputing”) (adds) high-end computing, high-capacity and high-speed networks, special purpose and experimental systems, applications and systems software, and the management of large data sets.

Changes the definition of “Network” in the act by striking a reference to the National Research and Education Network and replacing it with “means a computer network including advanced computer networks of Federal agencies and departments.

Changes the definition of “Program” from the “National High-Performance Computing Program” to the “networking and information technology research and development program.”

Sec. 3. Large-scale Research in Areas of National Importance

Adds a new section (Sec. 104) to the HPCC Act.

Requires NITRD agencies to support “large-scale, long-term, interdisciplinary research and development activities in networking and information technology directed toward application areas that have the potential for significant contributions to national economic competitiveness and for other societal benefits. Such activities, ranging from basic research to the demonstration of technical solutions, shall be designed to advance the development of research discoveries.” The President’s advisory committee is required to make recommendations to NITRD for research areas to support under this activity.

R&D activities in this section must include those selected using competitive, merit-based processes; involve collaborations among higher ed and industry, non-profit research institutions and Federal labs; when possible, leverage state initiatives; [and include a plan for fostering tech transfer to industry](#). The agencies must give special consideration to projects that include cost sharing from non-Federal sources.

If two agencies are working on research in the same area, they must strive to collaborate through joint solicitations and selection of applications. R&D under this section may be supported through interdisciplinary centers, including existing ones.

Sec. 4. Cyber-Physical Systems

(a) Adds an additional responsibility to the NITRD program to “provide for increased understanding of the scientific principals of cyber-physical systems and improve the methods available for the design, development, and operation of cyber-physical systems that are characterized by high reliability, safety, and security.”

Additionally, adds a responsibility for NITRD to “provide research and development on human-computer interactions, visualization, and big data.”

(b) Creates a new section of the HPCC (Sec. 105) that establishes a “University/Industry Task Force” to “explore mechanisms for carrying out collaborative research and development activities for cyber-physical systems, including the related technologies required to enable these systems, through a consortium or other appropriate entity with participants from institutions of higher education, Federal laboratories, and industry.

The task force must develop “options for a collaborative model and organizational structure” under which the CPS research could be performed; set an agenda “focused on national significant challenges and requiring collaboration”; define the roles and responsibilities of all participants; propose guidelines for figuring out IP and tech

transfer; and make recommendations for how research could be funded from Federal, state, and non-government sources.

(c) The task force will be appointed by the Director of NCO and shall include an equal number of CPS experts from high-ed (including minority-serving institutions and community colleges) and industry. [The Director can't appoint more than 2 people from Federal labs.](#)

(d) The task force will submit their report to relevant House and Senate committees within 12 months of passage of the act.

[\(e\) Once they've submitted the report, the task force shall terminate.](#)

(f) Members of the task force must serve for free.

Sec. 5. Cloud Computing Services for Research

[Adds a new section \(Sec. 106. Cloud Computing Services for Research\) to the HPCC. Within 6 months of the act's passage, the Director of NCO must convene an interagency working group to examine issues around "funding mechanisms and policies for the use of cloud computing services for federally-funded science and engineering research" and recommend guidelines on providing uniform guidance to researchers and organization on the funding and policies.](#)

[The working group must consult with academia, industry, Federal laboratories, and other relevant organizations. Within a year of the act's passage, the working group must report their findings to the relevant House and Senate committees, then disband.](#)

Sec. 6. National Coordination Office.

This section strikes Sec. 102 National Research and Education Network from the HPCC and replaces it with a description of the functions of the NCO.

The NCO shall provide technical and administrative support to the agencies and the President's advisory committee; serve as the primary point of contact on NITRD for everyone; solicit input and recommendations from stakeholders for the strategic plan, as well as convene at least 1 workshop on the plan with invitees from academia, industry, Federal labs, and other orgs; conduct public outreach; and promote access and early application of the tech derived from the program.

The NCO will be supported by funds from each agency participating in the program, in proportion to each agency's share of the total NITRD budget for the previous fiscal year.

Sec. 7. Improving Networking and Information Technology Education.

Adds a responsibility to NSF to “use its existing programs, in collaboration with other agencies, as appropriate, to improve the teaching and learning of networking and information technology at all levels of education and to increase participation in networking and information technology fields, including by women and underrepresented minorities.”

Sec. 8. Conforming and Technical Amendments

Throughout the bill where “high-performance computing” appears to refer to the whole field (as opposed to just the specific area of high-performance computing), replaces the phrase with “networking and information technology,” including in the “Purpose” section of the Act. (So it becomes “The purposes of this Act are to help ensure the continued leadership of the United States in ~~high-performance computing~~ networking and information technology and its applications...”).

In places where high-performance computing refers to the specific area of research, it’s replaced by “high-end computing.”