

111TH CONGRESS
1ST SESSION

H. R. 2020

To amend the High-Performance Computing Act of 1991 to authorize activities for support of networking and information technology research, and for other purposes.

IN THE HOUSE OF REPRESENTATIVES

APRIL 22, 2009

Mr. GORDON of Tennessee (for himself, Mr. HALL of Texas, Mr. LIPINSKI, Mr. EHLERS, Mr. WU, Mrs. BIGGERT, and Mr. LUJÁN) introduced the following bill; which was referred to the Committee on Science and Technology

A BILL

To amend the High-Performance Computing Act of 1991 to authorize activities for support of networking and information technology research, and for other purposes.

1 *Be it enacted by the Senate and House of Representa-*
2 *tives of the United States of America in Congress assembled,*

3 **SECTION 1. SHORT TITLE.**

4 This Act may be cited as the “Networking and Infor-
5 mation Technology Research and Development Act of
6 2009”.

1 **SEC. 2. PROGRAM PLANNING AND COORDINATION.**

2 (a) PERIODIC REVIEWS.—Section 101 of the High-
3 Performance Computing Act of 1991 (15 U.S.C. 5511)
4 is amended by adding at the end the following new sub-
5 section:

6 “(d) PERIODIC REVIEWS.—The agencies identified in
7 subsection (a)(3)(B) shall—

8 “(1) periodically assess the contents and fund-
9 ing levels of the Program Component Areas and re-
10 structure the Program when warranted, taking into
11 consideration any relevant recommendations of the
12 advisory committee established under subsection (b);
13 and

14 “(2) ensure that the Program includes large-
15 scale, long-term, interdisciplinary research and de-
16 velopment activities, including activities described in
17 section 104.”.

18 (b) DEVELOPMENT OF STRATEGIC PLAN.—Section
19 101 of such Act (15 U.S.C. 5511) is amended further by
20 adding after subsection (d), as added by subsection (a),
21 the following new subsection:

22 “(e) STRATEGIC PLAN.—

23 “(1) IN GENERAL.—The agencies identified in
24 subsection (a)(3)(B), working through the National
25 Science and Technology Council and with the assist-
26 ance of the National Coordination Office established

1 under section 106, shall develop, within 12 months
2 after the date of enactment of the Networking and
3 Information Technology Research and Development
4 Act of 2009, and update every 3 years thereafter, a
5 5-year strategic plan to guide the activities described
6 under subsection (a)(1).

7 “(2) CONTENTS.—The strategic plan shall
8 specify near-term and long-term objectives for the
9 Program, the anticipated time frame for achieving
10 the near-term objectives, the metrics to be used for
11 assessing progress toward the objectives, and how
12 the Program will—

13 “(A) foster the transfer of research and
14 development results into new technologies and
15 applications for the benefit of society, including
16 through cooperation and collaborations with
17 networking and information technology re-
18 search, development, and technology transition
19 initiatives supported by the States;

20 “(B) encourage and support mechanisms
21 for interdisciplinary research and development
22 in high-performance computing, including
23 through collaborations across agencies, across
24 Program Component Areas, with industry, with
25 Federal laboratories (as defined in section 4 of

1 the Stevenson-Wydler Technology Innovation
2 Act of 1980 (15 U.S.C. 3703)), and with inter-
3 national organizations;

4 “(C) address long-term challenges of na-
5 tional importance for which solutions require
6 large-scale, long-term, interdisciplinary research
7 and development;

8 “(D) place emphasis on innovative and
9 high-risk projects having the potential for sub-
10 stantial societal returns on the research invest-
11 ment; and

12 “(E) strengthen all levels of networking
13 and information technology education and
14 training programs to ensure an adequate, well-
15 trained workforce.

16 “(3) NATIONAL RESEARCH INFRASTRUCTURE.—The
17 strategic plan developed in accordance with paragraph (1)
18 shall be accompanied by milestones and roadmaps for es-
19 tablishing and maintaining the national research infra-
20 structure required to support the Program, including the
21 roadmap required by subsection (a)(2)(E).

22 “(4) RECOMMENDATIONS.—The entities involved in
23 developing the strategic plan under paragraph (1) shall
24 take into consideration the recommendations—

1 “(A) of the advisory committee established
2 under subsection (b); and

3 “(B) of the stakeholders whose input was solici-
4 ited by the National Coordination Office, as required
5 under section 106(b)(3).

6 “(5) REPORT TO CONGRESS.—The Director of the
7 National Coordination Office shall transmit the strategic
8 plan required under paragraph (1) to the advisory com-
9 mittee, the Committee on Commerce, Science, and Trans-
10 portation of the Senate, and the Committee on Science
11 and Technology of the House of Representatives.”.

12 (c) ADDITIONAL RESPONSIBILITIES OF DIRECTOR.—
13 Section 101(a)(2) of such Act (15 U.S.C. 5511(a)(2)) is
14 amended—

15 (1) by redesignating subparagraphs (E) and
16 (F) as subparagraphs (F) and (G), respectively; and

17 (2) by inserting after subparagraph (D) the fol-
18 lowing new subparagraph:

19 “(E) encourage and monitor the efforts of
20 the agencies participating in the Program to al-
21 locate the level of resources and management
22 attention necessary to ensure that the strategic
23 plan under subsection (e) is developed and exe-
24 cuted effectively and that the objectives of the
25 Program are met;”.

1 (d) ADVISORY COMMITTEE.—Section 101(b)(1) of
2 such Act (15 U.S.C. 5511(b)(1)) is amended by inserting
3 after “an advisory committee on high-performance com-
4 puting,” the following: “in which the co-chairs shall be
5 members of the President’s Council of Advisors on Science
6 and Technology and with the remainder of the com-
7 mittee”.

8 (e) REPORT.—Section 101(a)(3) of such Act (15
9 U.S.C. 5511(a)(3)) is amended—

10 (1) in subparagraph (C)—

11 (A) by striking “is submitted,” and insert-
12 ing “is submitted, the levels for the previous
13 fiscal year,”; and

14 (B) by striking “each Program Component
15 Area;” and inserting “each Program Compo-
16 nent Area and research area supported in ac-
17 cordance with section 104;”;

18 (2) in subparagraph (D)—

19 (A) by striking “each Program Component
20 Area,” and inserting “each Program Compo-
21 nent Area and research area supported in ac-
22 cordance with section 104;”;

23 (B) by striking “is submitted,” and insert-
24 ing “is submitted, the levels for the previous
25 fiscal year,”; and

1 (C) by striking “and” after the semicolon;

2 (3) by redesignating subparagraph (E) as sub-
3 paragraph (G); and

4 (4) by inserting after subparagraph (D) the fol-
5 lowing new subparagraphs:

6 “(E) include a description of how the ob-
7 jectives for each Program Component Area, and
8 the objectives for activities that involve multiple
9 Program Component Areas, relate to the objec-
10 tives of the Program identified in the strategic
11 plan required under subsection (e);

12 “(F) include—

13 “(i) a description of the funding re-
14 quired by the National Coordination Office
15 to perform the functions specified under
16 section 106(b) for the next fiscal year by
17 category of activity;

18 “(ii) a description of the funding re-
19 quired by such Office to perform the func-
20 tions specified under section 106(b) for the
21 current fiscal year by category of activity;
22 and

23 “(iii) the amount of funding provided
24 for such Office for the current fiscal year

1 by each agency participating in the Pro-
2 gram; and”.

3 (f) DEFINITION.—Section 4 of such Act (15 U.S.C.
4 5503) is amended—

5 (1) by redesignating paragraphs (1) through
6 (7) as paragraphs (2) through (8), respectively; and

7 (2) by inserting before paragraph (2), as so re-
8 designated, the following new paragraph:

9 “(1) ‘cyber-physical systems’ means physical or
10 engineered systems whose networking and informa-
11 tion technology functions and physical elements are
12 deeply integrated and are actively connected to the
13 physical world through sensors, actuators, or other
14 means to perform monitoring and control func-
15 tions;”.

16 **SEC. 3. LARGE-SCALE RESEARCH IN AREAS OF NATIONAL**
17 **IMPORTANCE.**

18 Title I of such Act (15 U.S.C. 5511) is amended by
19 adding at the end the following new section:

20 **“SEC. 104. LARGE-SCALE RESEARCH IN AREAS OF NA-**
21 **TIONAL IMPORTANCE.**

22 “(a) IN GENERAL.—The Program shall encourage
23 agencies identified in section 101(a)(3)(B) to support
24 large-scale, long-term, interdisciplinary research and de-
25 velopment activities in high-performance computing di-

1 rected toward application areas that have the potential for
2 significant contributions to national economic competitive-
3 ness and for other significant societal benefits. Such ac-
4 tivities, ranging from basic research to the demonstration
5 of technical solutions, shall be designed to advance the de-
6 velopment of research discoveries. The advisory committee
7 established under section 101(b) shall make recommenda-
8 tions to the Program for candidate research and develop-
9 ment areas for support under this section.

10 “(b) CHARACTERISTICS.—

11 “(1) IN GENERAL.—Research and development
12 activities under this section shall—

13 “(A) include projects selected on the basis
14 of applications for support through a competi-
15 tive, merit-based process;

16 “(B) involve collaborations among re-
17 searchers in institutions of higher education
18 and industry, and may involve nonprofit re-
19 search institutions and Federal laboratories, as
20 appropriate;

21 “(C) when possible, leverage Federal in-
22 vestments through collaboration with related
23 State initiatives; and

24 “(D) include a plan for fostering the trans-
25 fer of research discoveries and the results of

1 technology demonstration activities to industry
2 for commercial development.

3 “(2) COST-SHARING.—In selecting applications
4 for support, the agencies shall give special consider-
5 ation to projects that include cost sharing from non-
6 Federal sources.

7 “(3) AGENCY COLLABORATION.—If 2 or more
8 agencies identified in section 101(a)(3)(B), or other
9 appropriate agencies, are working on large-scale re-
10 search and development activities in the same area
11 of national importance, then such agencies shall
12 strive to collaborate through joint solicitation and se-
13 lection of applications for support and subsequent
14 funding of projects.

15 “(4) INTERDISCIPLINARY RESEARCH CEN-
16 TERS.—Research and development activities under
17 this section may be supported through interdiscipli-
18 nary research centers that are organized to inves-
19 tigate basic research questions and carry out tech-
20 nology demonstration activities in areas described in
21 subsection (a). Research may be carried out through
22 existing interdisciplinary centers, including those au-
23 thorized under section 7024(b)(2) of the America
24 COMPETES Act (Public Law 110–69; 42 U.S.C.
25 1862o–10).”.

1 **SEC. 4. CYBER-PHYSICAL SYSTEMS AND INFORMATION**
2 **MANAGEMENT.**

3 (a) **ADDITIONAL PROGRAM CHARACTERISTICS.**—Sec-
4 tion 101(a)(1) of such Act (15 U.S.C. 5511(a)(1)) is
5 amended—

6 (1) in subparagraph (H), by striking “and”
7 after the semicolon;

8 (2) in subparagraph (I), by striking the period
9 at the end and inserting a semicolon; and

10 (3) by adding at the end the following new sub-
11 paragraphs:

12 “(J) provide for increased understanding
13 of the scientific principles of cyber-physical sys-
14 tems and improve the methods available for the
15 design, development, and operation of cyber-
16 physical systems that are characterized by high
17 reliability, safety, and security; and

18 “(K) provide for research and development
19 on human-computer interactions, visualization,
20 and information management.”.

21 (b) **TASK FORCE.**—Title I of such Act (15 U.S.C.
22 5511) is amended further by adding after section 104, as
23 added by section 3, the following new section:

24 **“SEC. 105. UNIVERSITY/INDUSTRY TASK FORCE.**

25 “(a) **ESTABLISHMENT.**—Not later than 180 days
26 after the date of enactment of the Networking and Infor-

1 mation Technology Research and Development Act of
2 2009, the Director of the National Coordination Office es-
3 tablished under section 106 shall convene a task force to
4 explore mechanisms for carrying out collaborative research
5 and development activities for cyber-physical systems, in-
6 cluding the related technologies required to enable these
7 systems, through a consortium or other appropriate entity
8 with participants from institutions of higher education,
9 Federal laboratories, and industry.

10 “(b) FUNCTIONS.—The task force shall—

11 “(1) develop options for a collaborative model
12 and an organizational structure for such entity
13 under which the joint research and development ac-
14 tivities could be planned, managed, and conducted
15 effectively, including mechanisms for the allocation
16 of resources among the participants in such entity
17 for support of such activities;

18 “(2) propose a process for developing a re-
19 search and development agenda for such entity, in-
20 cluding objectives and milestones;

21 “(3) define the roles and responsibilities for the
22 participants from institutions of higher education
23 and industry in such entity;

1 “(4) propose guidelines for assigning intellec-
2 tual property rights and for the transfer of research
3 results to the private sector; and

4 “(5) make recommendations for how such enti-
5 ty could be funded from Federal, State, and non-
6 governmental sources.

7 “(c) COMPOSITION.—In establishing the task force
8 under subsection (a), the Director of the National Coordi-
9 nation Office shall appoint an equal number of individuals
10 from institutions of higher education and from industry
11 with knowledge and expertise in cyber-physical systems,
12 of which 2 may be selected from Federal laboratories.

13 “(d) REPORT.—Not later than 1 year after the date
14 of enactment of the Networking and Information Tech-
15 nology Research and Development Act of 2009, the Direc-
16 tor of the National Coordination Office shall transmit to
17 the Committee on Commerce, Science, and Transportation
18 of the Senate and the Committee on Science and Tech-
19 nology of the House of Representatives a report describing
20 the findings and recommendations of the task force.”.

21 **SEC. 5. NATIONAL COORDINATION OFFICE.**

22 Title I of such Act (15 U.S.C. 5511) is amended fur-
23 ther by adding after section 105, as added by section 4,
24 the following new section:

1 **“SEC. 106. NATIONAL COORDINATION OFFICE.**

2 “(a) ESTABLISHMENT.—The Director shall establish
3 a National Coordination Office with a Director and full-
4 time staff.

5 “(b) FUNCTIONS.—The National Coordination Office
6 shall—

7 “(1) provide technical and administrative sup-
8 port to—

9 “(A) the agencies participating in planning
10 and implementing the Program, including such
11 support as needed in the development of the
12 strategic plan under section 101(e); and

13 “(B) the advisory committee established
14 under section 101(b);

15 “(2) serve as the primary point of contact on
16 Federal high-performance computing activities for
17 government organizations, academia, industry, pro-
18 fessional societies, State computing and networking
19 technology programs, interested citizen groups, and
20 others to exchange technical and programmatic in-
21 formation;

22 “(3) solicit input and recommendations from a
23 wide range of stakeholders during the development
24 of each strategic plan required under section 101(e)
25 through the convening of at least 1 workshop with
26 invitees from academia, industry, Federal labora-

1 tories, and other relevant organizations and institu-
2 tions;

3 “(4) conduct public outreach, including the dis-
4 semination of findings and recommendations of the
5 advisory committee, as appropriate; and

6 “(5) promote access to and early application of
7 the technologies, innovations, and expertise derived
8 from Program activities to agency missions and sys-
9 tems across the Federal Government and to United
10 States industry.

11 “(c) SOURCE OF FUNDING.—

12 “(1) IN GENERAL.—The operation of the Na-
13 tional Coordination Office shall be supported by
14 funds from each agency participating in the Pro-
15 gram.

16 “(2) SPECIFICATIONS.—The portion of the total
17 budget of such Office that is provided by each agen-
18 cy for each fiscal year shall be in the same propor-
19 tion as each such agency’s share of the total budget
20 for the Program for the previous fiscal year, as spec-
21 ified in the report required under section
22 101(a)(3).”.

○