

107TH CONGRESS  
1ST SESSION

# H. R. 3394

To authorize funding for computer and network security research and development and research fellowship programs, and for other purposes.

---

## IN THE HOUSE OF REPRESENTATIVES

DECEMBER 4, 2001

Mr. BOEHLERT (for himself, Mr. HALL of Texas, Mr. SMITH of Texas, Mr. BAIRD, Mr. SMITH of Michigan, and Ms. EDDIE BERNICE JOHNSON of Texas) introduced the following bill; which was referred to the Committee on Science, and in addition to the Committee on Education and the Workforce, for a period to be subsequently determined by the Speaker, in each case for consideration of such provisions as fall within the jurisdiction of the committee concerned

---

## A BILL

To authorize funding for computer and network security research and development and research fellowship programs, 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 “Cyber Security Re-  
5       search and Development Act”.

6       **SEC. 2. FINDINGS.**

7       The Congress finds the following:

1           (1) Revolutionary advancements in computing  
2           and communications technology have interconnected  
3           government, commercial, scientific, and educational  
4           infrastructures—including critical infrastructures for  
5           electric power, natural gas and petroleum production  
6           and distribution, telecommunications, transportation,  
7           water supply, banking and finance, and emergency  
8           and government services—in a vast, interdependent  
9           physical and electronic network.

10          (2) Exponential increases in interconnectivity  
11          have facilitated enhanced communications, economic  
12          growth, and the delivery of services critical to the  
13          public welfare, but have also increased the con-  
14          sequences of temporary or prolonged failure.

15          (3) A Department of Defense Joint Task Force  
16          concluded after a 1997 United States information  
17          warfare exercise that the results “clearly dem-  
18          onstrated our lack of preparation for a coordinated  
19          cyber and physical attack on our critical military  
20          and civilian infrastructure”.

21          (4) Computer security technology and systems  
22          implementation lack—

23                (A) sufficient long term research funding;

1 (B) adequate coordination across Federal  
2 and State government agencies and among gov-  
3 ernment, academia, and industry;

4 (C) sufficient numbers of outstanding re-  
5 searchers in the field; and

6 (D) market incentives for the design of  
7 commercial and consumer security solutions.

8 (5) Accordingly, Federal investment in com-  
9 puter and network security research and develop-  
10 ment must be significantly increased to—

11 (A) improve vulnerability assessment and  
12 technological and systems solutions;

13 (B) expand and improve the pool of infor-  
14 mation security professionals, including re-  
15 searchers, in the United States workforce; and

16 (C) better coordinate information sharing  
17 and collaboration among industry, government,  
18 and academic research projects.

19 **SEC. 3. DEFINITIONS.**

20 For purposes of this Act—

21 (1) the term “Director” means the Director of  
22 the National Science Foundation; and

23 (2) the term “institution of higher education”  
24 has the meaning given that term in section 101 of

1 the Higher Education Act of 1965 (20 U.S.C.  
2 1001).

3 **SEC. 4. NATIONAL SCIENCE FOUNDATION RESEARCH.**

4 (a) COMPUTER AND NETWORK SECURITY RESEARCH  
5 GRANTS.—

6 (1) IN GENERAL.—The Director shall award  
7 grants for basic research on innovative approaches  
8 to the structure of computer and network hardware  
9 and software that are aimed at enhancing computer  
10 security. Research areas may include—

11 (A) authentication and cryptography;

12 (B) computer forensics and intrusion de-  
13 tection;

14 (C) reliability of computer and network ap-  
15 plications, middleware, operating systems, and  
16 communications infrastructure; and

17 (D) privacy and confidentiality.

18 (2) MERIT REVIEW; COMPETITION.—Grants  
19 shall be awarded under this section on a merit-re-  
20 viewed competitive basis.

21 (3) AUTHORIZATION OF APPROPRIATIONS.—  
22 There are authorized to be appropriated to the Na-  
23 tional Science Foundation to carry out this  
24 subsection—

25 (A) \$35,000,000 for fiscal year 2003;

- 1 (B) \$40,000,000 for fiscal year 2004;  
2 (C) \$46,000,000 for fiscal year 2005;  
3 (D) \$52,000,000 for fiscal year 2006; and  
4 (E) \$60,000,000 for fiscal year 2007.

5 (b) COMPUTER AND NETWORK SECURITY RESEARCH  
6 CENTERS.—

7 (1) IN GENERAL.—The Director shall award  
8 multiyear grants, subject to the availability of appro-  
9 priations, to institutions of higher education (or con-  
10 sortia thereof) to establish multidisciplinary Centers  
11 for Computer and Network Security Research. Insti-  
12 tutions of higher education (or consortia thereof) re-  
13 ceiving such grants may partner with one or more  
14 government laboratories or for-profit institutions.

15 (2) MERIT REVIEW; COMPETITION.—Grants  
16 shall be awarded under this subsection on a merit-  
17 reviewed competitive basis.

18 (3) PURPOSE.—The purpose of the Centers  
19 shall be to generate innovative approaches to com-  
20 puter and network security by conducting cutting-  
21 edge, multidisciplinary research in computer and  
22 network security, including the research areas de-  
23 scribed in subsection (a)(1).

24 (4) APPLICATIONS.—An institution of higher  
25 education (or a consortium of such institutions)

1 seeking funding under this subsection shall submit  
2 an application to the Director at such time, in such  
3 manner, and containing such information as the Di-  
4 rector may require. The application shall include, at  
5 a minimum, a description of—

6 (A) the research projects that will be un-  
7 dertaken by the Center and the contributions of  
8 each of the participating entities;

9 (B) how the Center will promote active col-  
10 laboration among scientists and engineers from  
11 different disciplines, such as computer sci-  
12 entists, engineers, mathematicians, and social  
13 science researchers; and

14 (C) how the Center will contribute to in-  
15 creasing the number of computer and network  
16 security researchers and other professionals.

17 (5) CRITERIA.—In evaluating the applications  
18 submitted under paragraph (4), the Director shall  
19 consider, at a minimum—

20 (A) the ability of the applicant to generate  
21 innovative approaches to computer and network  
22 security and effectively carry out the research  
23 program;

24 (B) the experience of the applicant in con-  
25 ducting research on computer and network se-

1 security and the capacity of the applicant to fos-  
2 ter new multidisciplinary collaborations;

3 (C) the capacity of the applicant to attract  
4 and provide adequate support for under-  
5 graduate and graduate students and  
6 postdoctoral fellows to pursue computer and  
7 network security research; and

8 (D) the extent to which the applicant will  
9 partner with government laboratories or for-  
10 profit entities, and the role the government lab-  
11 oratories or for-profit entities will play in the  
12 research undertaken by the Center.

13 (6) ANNUAL MEETING.—The Director shall  
14 convene an annual meeting of the Centers in order  
15 to foster collaboration and communication between  
16 Center participants.

17 (7) AUTHORIZATION OF APPROPRIATIONS.—  
18 There are authorized to be appropriated for the Na-  
19 tional Science Foundation to carry out this  
20 subsection—

21 (A) \$12,000,000 for fiscal year 2003;

22 (B) \$24,000,000 for fiscal year 2004;

23 (C) \$36,000,000 for fiscal year 2005;

24 (D) \$36,000,000 for fiscal year 2006; and

25 (E) \$36,000,000 for fiscal year 2007.

1 **SEC. 5. NATIONAL SCIENCE FOUNDATION COMPUTER AND**  
2 **NETWORK SECURITY PROGRAMS.**

3 (a) COMPUTER AND NETWORK SECURITY CAPACITY  
4 BUILDING GRANTS.—

5 (1) IN GENERAL.—The Director shall establish  
6 a program to award grants to institutions of higher  
7 education (or consortia thereof) to establish or im-  
8 prove undergraduate and master’s degree programs  
9 in computer and network security, to increase the  
10 number of students who pursue undergraduate or  
11 master’s degrees in fields related to computer and  
12 network security, and to provide students with expe-  
13 rience in government or industry related to their  
14 computer and network security studies.

15 (2) MERIT REVIEW.—Grants shall be awarded  
16 under this subsection on a merit-reviewed competi-  
17 tive basis.

18 (3) USE OF FUNDS.—Grants awarded under  
19 this subsection shall be used for activities that en-  
20 hance the ability of an institution of higher edu-  
21 cation (or consortium thereof) to provide high-qual-  
22 ity undergraduate and master’s degree programs in  
23 computer and network security and to recruit and  
24 retain increased numbers of students to such pro-  
25 grams. Activities may include—



1 (A) revising curriculum to better prepare  
2 undergraduate and master's degree students for  
3 careers in computer and network security;

4 (B) establishing degree and certificate pro-  
5 grams in computer and network security;

6 (C) creating opportunities for under-  
7 graduate students to participate in computer  
8 and network security research projects;

9 (D) acquiring equipment necessary for stu-  
10 dent instruction in computer and network secu-  
11 rity, including the installation of testbed net-  
12 works for student use;

13 (E) providing opportunities for faculty to  
14 work with local or Federal Government agen-  
15 cies, private industry, or other academic institu-  
16 tions to develop new expertise or to formulate  
17 new research directions in computer and net-  
18 work security;

19 (F) establishing collaborations with other  
20 academic institutions or departments that seek  
21 to establish, expand, or enhance programs in  
22 computer and network security;

23 (G) establishing student internships in  
24 computer and network security at government  
25 agencies or in private industry;

1 (H) establishing or enhancing bridge pro-  
2 grams in computer and network security be-  
3 tween community colleges and universities; and

4 (I) any other activities the Director deter-  
5 mines will accomplish the goals of this sub-  
6 section.

7 (4) SELECTION PROCESS.—

8 (A) APPLICATION.—An institution of high-  
9 er education (or a consortium thereof) seeking  
10 funding under this subsection shall submit an  
11 application to the Director at such time, in such  
12 manner, and containing such information as the  
13 Director may require. The application shall in-  
14 clude, at a minimum—

15 (i) a description of the applicant's  
16 computer and network security research  
17 and instructional capacity, and in the case  
18 of an application from a consortium of in-  
19 stitutions of higher education, a descrip-  
20 tion of the role that each member will play  
21 in implementing the proposal;

22 (ii) a comprehensive plan by which the  
23 institution or consortium will build instruc-  
24 tional capacity in computer and informa-  
25 tion security;

1 (iii) a description of relevant collabo-  
2 rations with government agencies or pri-  
3 vate industry that inform the instructional  
4 program in computer and network secu-  
5 rity;

6 (iv) a survey of the applicant's his-  
7 toric student enrollment and placement  
8 data in fields related to computer and net-  
9 work security and a study of potential en-  
10 rollment and placement for students en-  
11 rolled in the proposed computer and net-  
12 work security program; and

13 (v) a plan to evaluate the success of  
14 the proposed computer and network secu-  
15 rity program, including post-graduation as-  
16 sessment of graduate school and job place-  
17 ment and retention rates as well as the rel-  
18 evance of the instructional program to  
19 graduate study and to the workplace.

20 (B) AWARDS.—(i) The Director shall en-  
21 sure, to the extent practicable, that grants are  
22 awarded under this subsection in a wide range  
23 of geographic areas and categories of institu-  
24 tions of higher education.

1 (ii) The Director shall award grants under  
2 this subsection for a period not to exceed 5  
3 years.

4 (5) ASSESSMENT REQUIRED.—The Director  
5 shall evaluate the program established under this  
6 subsection no later than 6 years after the establish-  
7 ment of the program. At a minimum, the Director  
8 shall evaluate the extent to which the grants  
9 achieved their objectives of increasing the quality  
10 and quantity of students pursuing undergraduate or  
11 master's degrees in computer and network security.

12 (6) AUTHORIZATION OF APPROPRIATIONS.—  
13 There are authorized to be appropriated to the Na-  
14 tional Science Foundation to carry out this  
15 subsection—

- 16 (A) \$15,000,000 for fiscal year 2003;  
17 (B) \$20,000,000 for fiscal year 2004;  
18 (C) \$20,000,000 for fiscal year 2005;  
19 (D) \$20,000,000 for fiscal year 2006; and  
20 (E) \$20,000,000 for fiscal year 2007.

21 (b) SCIENTIFIC AND ADVANCED TECHNOLOGY ACT  
22 OF 1992.—

23 (1) GRANTS.—The Director shall provide  
24 grants under the Scientific and Advanced Tech-  
25 nology Act of 1992 for the purposes of section 3(a)

1 and (b) of that Act, except that the activities sup-  
2 ported pursuant to this subsection shall be limited to  
3 improving education in fields related to computer  
4 and network security.

5 (2) AUTHORIZATION OF APPROPRIATIONS.—

6 There are authorized to be appropriated to the Na-  
7 tional Science Foundation to carry out this  
8 subsection—

9 (A) \$1,000,000 for fiscal year 2003;

10 (B) \$1,250,000 for fiscal year 2004;

11 (C) \$1,250,000 for fiscal year 2005;

12 (D) \$1,250,000 for fiscal year 2006; and

13 (E) \$1,250,000 for fiscal year 2007.

14 (c) GRADUATE TRAINEESHIPS IN COMPUTER AND  
15 NETWORK SECURITY RESEARCH.—

16 (1) IN GENERAL.—The Director shall establish  
17 a program to award grants to institutions of higher  
18 education to establish traineeship programs for  
19 graduate students who pursue computer and net-  
20 work security research leading to a doctorate degree  
21 by providing funding and other assistance, and by  
22 providing graduate students with research experience  
23 in government or industry related to the students'  
24 computer and network security studies.

1           (2) MERIT REVIEW.—Grants shall be provided  
2           under this subsection on a merit-reviewed competi-  
3           tive basis.

4           (3) USE OF FUNDS.—An institution of higher  
5           education shall use grant funds for the purposes  
6           of—

7                   (A) providing fellowships to students who  
8                   are citizens, nationals, or lawfully admitted per-  
9                   manent resident aliens of the United States and  
10                  are pursuing research in computer or network  
11                  security leading to a doctorate degree;

12                  (B) paying tuition and fees for students  
13                  receiving fellowships under subparagraph (A);

14                  (C) establishing scientific internship pro-  
15                  grams for students receiving fellowships under  
16                  subparagraph (A) in computer and network se-  
17                  curity at for-profit institutions or government  
18                  laboratories; and

19                  (D) other costs associated with the admin-  
20                  istration of the program.

21           (4) FELLOWSHIP AMOUNT.—Fellowships pro-  
22           vided under paragraph (3)(A) shall be in the amount  
23           of \$25,000 per year, or the level of the National  
24           Science Foundation Graduate Research Fellowships,  
25           whichever is greater, for up to 3 years.

1           (5) SELECTION PROCESS.—An institution of  
2       higher education seeking funding under this sub-  
3       section shall submit an application to the Director at  
4       such time, in such manner, and containing such in-  
5       formation as the Director may require. The applica-  
6       tion shall include, at a minimum, a description of—

7           (A) the instructional program and research  
8       opportunities in computer and network security  
9       available to graduate students at the applicant’s  
10      institution; and

11          (B) the internship program to be estab-  
12      lished, including the opportunities that will be  
13      made available to students for internships at  
14      for-profit institutions and government labora-  
15      tories.

16          (6) REVIEW OF APPLICATIONS.—In evaluating  
17      the applications submitted under paragraph (5), the  
18      Director shall consider—

19          (A) the ability of the applicant to effec-  
20      tively carry out the proposed program;

21          (B) the quality of the applicant’s existing  
22      research and education programs;

23          (C) the likelihood that the program will re-  
24      cruit increased numbers of students to pursue

1 and earn doctorate degrees in computer and  
 2 network security;

3 (D) the nature and quality of the intern-  
 4 ship program established through collaborations  
 5 with government laboratories and for-profit in-  
 6 stitutions;

7 (E) the integration of internship opportu-  
 8 nities into graduate students' research; and

9 (F) the relevance of the proposed program  
 10 to current and future computer and network se-  
 11 curity needs.

12 (7) AUTHORIZATION OF APPROPRIATIONS.—  
 13 There are authorized to be appropriated to the Na-  
 14 tional Science Foundation to carry out this  
 15 subsection—

16 (A) \$10,000,000 for fiscal year 2003;

17 (B) \$20,000,000 for fiscal year 2004;

18 (C) \$20,000,000 for fiscal year 2005;

19 (D) \$20,000,000 for fiscal year 2006; and

20 (E) \$20,000,000 for fiscal year 2007.

21 (d) GRADUATE RESEARCH FELLOWSHIPS PROGRAM  
 22 SUPPORT.—Computer and network security shall be in-  
 23 cluded among the fields of specialization supported by the  
 24 National Science Foundation's Graduate Research Fellow-



1 ships program under section 10 of the National Science  
2 Foundation Act of 1950 (42 U.S.C. 1869).

3 **SEC. 6. CONSULTATION.**

4 In carrying out sections 4 and 5, the Director shall  
5 consult with other Federal agencies.

6 **SEC. 7. FOSTERING RESEARCH AND EDUCATION IN COM-**  
7 **PUTER AND NETWORK SECURITY.**

8 Section 3(a) of the National Science Foundation Act  
9 of 1950 (42 U.S.C. 1862(a)) is amended—

10 (1) by striking “and” at the end of paragraph  
11 (6);

12 (2) by striking the period at the end of para-  
13 graph (7) and inserting “; and”; and

14 (3) by adding at the end the following new  
15 paragraph:

16 “(8) to take a leading role in fostering and sup-  
17 porting research and education activities to improve  
18 the security of networked information systems.”.

19 **SEC. 8. NATIONAL INSTITUTE OF STANDARDS AND TECH-**  
20 **NOLOGY RESEARCH PROGRAM.**

21 The National Institute of Standards and Technology  
22 Act is amended—

23 (1) by moving section 22 to the end of the Act  
24 and redesignating it as section 32;

3 “RESEARCH PROGRAM ON SECURITY OF COMPUTER  
4 SYSTEMS

11 “(1) include multidisciplinary, long-term, high-  
12 risk research;

“(3) promote the development of a robust re-  
search community working at the leading edge of  
knowledge in subject areas relevant to the security  
of computer systems by providing support for grad-  
uate students, post-doctoral researchers, and senior  
researchers.

23       “(b) FELLOWSHIPS.—(1) The Director is authorized  
24   to establish a program to award post-doctoral research fel-  
25   lowships to individuals who are citizens, nationals, or law-  
26   fully admitted permanent resident aliens of the United

1 States and are seeking research positions at institutions,  
2 including the Institute, engaged in research activities re-  
3 lated to the security of computer systems, including the  
4 research areas described in section 4(a)(1) of the Cyber  
5 Security Research and Development Act.

6 “(2) The Director is authorized to establish a pro-  
7 gram to award senior research fellowships to individuals  
8 seeking research positions at institutions, including the In-  
9 stitute, engaged in research activities related to the secu-  
10 rity of computer systems, including the research areas de-  
11 scribed in section 4(a)(1) of the Cyber Security Research  
12 and Development Act. Senior research fellowships shall be  
13 made available for established researchers at institutions  
14 of higher education who seek to change research fields and  
15 pursue studies related to the security of computer systems.

16 “(3)(A) To be eligible for an award under this sub-  
17 section, an individual shall submit an application to the  
18 Director at such time, in such manner, and containing  
19 such information as the Director may require.

20 “(B) Under this subsection, the Director is author-  
21 ized to provide stipends for post-doctoral research fellow-  
22 ships at the level of the Institute’s Post Doctoral Research  
23 Fellowship Program and senior research fellowships at lev-  
24 els consistent with support for a faculty member in a sab-  
25 batical position.

1       “(c) AWARDS; APPLICATIONS.—The Director is au-  
2       thorized to award grants or cooperative agreements to in-  
3       stitutions of higher education to carry out the program  
4       established under subsection (a). To be eligible for an  
5       award under this section, an institution of higher edu-  
6       cation shall submit an application to the Director at such  
7       time, in such manner, and containing such information as  
8       the Director may require. The application shall include,  
9       at a minimum, a description of—

10               “(1) the number of graduate students antici-  
11               pated to participate in the research project and the  
12               level of support to be provided to each;

13               “(2) the number of post-doctoral research posi-  
14               tions included under the research project and the  
15               level of support to be provided to each;

16               “(3) the number of individuals, if any, intend-  
17               ing to change research fields and pursue studies re-  
18               lated to the security of computer systems to be in-  
19               cluded under the research project and the level of  
20               support to be provided to each; and

21               “(4) how the for-profit entities and any other  
22               partners will participate in developing and carrying  
23               out the research and education agenda of the part-  
24               nership.

1       “(d) PROGRAM OPERATION.—(1) The program es-  
2     tablished under subsection (a) shall be managed by indi-  
3     viduals who shall have both expertise in research related  
4     to the security of computer systems and knowledge of the  
5     vulnerabilities of existing computer systems. The Director  
6     shall designate such individuals as program managers.

7       “(2) Program managers designated under paragraph  
8     (1) may be new or existing employees of the Institute or  
9     individuals on assignment at the Institute under the Inter-  
10    governmental Personnel Act of 1970.

11       “(3) Program managers designated under paragraph  
12    (1) shall be responsible for—

13               “(A) establishing and publicizing the broad re-  
14               search goals for the program;

15               “(B) soliciting applications for specific research  
16               projects to address the goals developed under sub-  
17               paragraph (A);

18               “(C) selecting research projects for support  
19               under the program from among applications sub-  
20               mitted to the Institute, following consideration of—

21                       “(i) the novelty and scientific and technical  
22                       merit of the proposed projects;

23                       “(ii) the demonstrated capabilities of the  
24                       individual or individuals submitting the applica-

1           tions to successfully carry out the proposed re-  
2           search;

3           “(iii) the impact the proposed projects will  
4           have on increasing the number of computer se-  
5           curity researchers;

6           “(iv) the nature of the participation by for-  
7           profit entities and the extent to which the pro-  
8           posed projects address the concerns of industry;  
9           and

10          “(v) other criteria determined by the Di-  
11          rector, based on information specified for inclu-  
12          sion in applications under subsection (c); and

13          “(D) monitoring the progress of research  
14          projects supported under the program.

15          “(e) REVIEW OF PROGRAM.—(1) The Director shall  
16          periodically review the portfolio of research awards mon-  
17          itored by each program manager designated in accordance  
18          with subsection (d). In conducting those reviews, the Di-  
19          rector shall seek the advice of the Computer System Secu-  
20          rity and Privacy Advisory Board, established under section  
21          21, on the appropriateness of the research goals and on  
22          the quality and utility of research projects managed by  
23          program managers in accordance with subsection (d).

24          “(2) The Director shall also contract with the Na-  
25          tional Research Council for a comprehensive review of the

1 program established under subsection (a) during the 5th  
2 year of the program. Such review shall include an assess-  
3 ment of the scientific quality of the research conducted,  
4 the relevance of the research results obtained to the goals  
5 of the program established under subsection (d)(3)(A),  
6 and the progress of the program in promoting the develop-  
7 ment of a substantial academic research community work-  
8 ing at the leading edge of knowledge in the field. The Di-  
9 rector shall submit to Congress a report on the results  
10 of the review under this paragraph no later than six years  
11 after the initiation of the program.

12 “(f) DEFINITIONS.—For purposes of this section—

13 “(1) the term ‘computer system’ has the mean-  
14 ing given that term in section 20(d)(1); and

15 “(2) the term ‘institution of higher education’  
16 has the meaning given that term in section 101 of  
17 the Higher Education Act of 1965 (20 U.S.C.  
18 1001).”; and

19 (3) in section 20(d)(1)(B)(i) (15 U.S.C. 278g–  
20 3(d)(1)(B)(i)), by inserting “and computer net-  
21 works” after “computers”.

1 **SEC. 9. COMPUTER SECURITY REVIEW, PUBLIC MEETINGS,**  
2 **AND INFORMATION.**

3 Section 20 of the National Institute of Standards and  
4 Technology Act (15 U.S.C. 278g–3) is amended by adding  
5 at the end the following new subsection:

6 “(f) There are authorized to be appropriated to the  
7 Secretary \$1,060,000 for fiscal year 2003 and \$1,090,000  
8 for fiscal year 2004 to enable the Computer System Secu-  
9 rity and Privacy Advisory Board, established by section  
10 21, to identify emerging issues, including research needs,  
11 related to computer security, privacy, and cryptography  
12 and, as appropriate, to convene public meetings on those  
13 subjects, receive presentations, and publish reports, di-  
14 gests, and summaries for public distribution on those sub-  
15 jects.”.

16 **SEC. 10. INTRAMURAL SECURITY RESEARCH.**

17 Section 20 of the National Institute of Standards and  
18 Technology Act (15 U.S.C. 278g–3) is further amended—

19 (1) by redesignating subsection (d) as sub-  
20 section (e); and

21 (2) by inserting after subsection (c) the fol-  
22 lowing new subsection:

23 “(d) As part of the research activities conducted in  
24 accordance with subsection (b)(4), the Institute shall—

25 “(1) conduct a research program to address  
26 emerging technologies associated with assembling a



1       networked computer system from components while  
2       ensuring it maintains desired security properties;

3               “(2) carry out research and support standards  
4       development activities associated with improving the  
5       security of real-time computing and communications  
6       systems for use in process control; and

7               “(3) carry out multidisciplinary, long-term,  
8       high-risk research on ways to improve the security  
9       of computer systems.”.

10 **SEC. 11. AUTHORIZATION OF APPROPRIATIONS.**

11       There are authorized to be appropriated to the Sec-  
12       retary of Commerce for the National Institute of Stand-  
13       ards and Technology—

14               (1) for activities under section 22 of the Na-  
15       tional Institute of Standards and Technology Act, as  
16       added by section 8 of this Act—

17                       (A) \$25,000,000 for fiscal year 2003;

18                       (B) \$40,000,000 for fiscal year 2004;

19                       (C) \$55,000,000 for fiscal year 2005;

20                       (D) \$70,000,000 for fiscal year 2006;

21                       (E) \$85,000,000 for fiscal year 2007; and

22                       (F) such sums as may be necessary for fis-  
23       cal years 2008 through 2012; and

(2) for activities under section 20(d) of the National Institute of Standards and Technology Act, as added by section 10 of this Act—

(A) \$6,000,000 for fiscal year 2003;

(B) \$6,200,000 for fiscal year 2004;

(C) \$6,400,000 for fiscal year 2005;

(D) \$6,600,000 for fiscal year 2006; and

(E) \$6,800,000 for fiscal year 2007.

**SEC. 12. NATIONAL ACADEMY OF SCIENCES STUDY ON  
COMPUTER AND NETWORK SECURITY IN  
CRITICAL INFRASTRUCTURES.**

(a) STUDY.—Not later than 3 months after the date of the enactment of this Act, the Director of the National Institute of Standards and Technology shall enter into an arrangement with the National Research Council of the National Academy of Sciences to conduct a study of the vulnerabilities of the Nation’s network infrastructure and make recommendations for appropriate improvements. The National Research Council shall—

(1) review existing studies and associated data on the architectural, hardware, and software vulnerabilities and interdependencies in United States critical infrastructure networks;

(2) identify and assess gaps in technical capability for robust critical infrastructure network secu-

1       rity, and make recommendations for research prior-  
2       ities and resource requirements; and

3           (3) review any and all other essential elements  
4       of computer and network security, including security  
5       of industrial process controls, to be determined in  
6       the conduct of the study.

7       (b) REPORT.—The Director of the National Institute  
8       of Standards and Technology shall transmit a report con-  
9       taining the results of the study and recommendations re-  
10      quired by subsection (a) to the Congress not later than  
11      21 months after the date of enactment of this Act.

12      (c) SECURITY.—The Director of the National Insti-  
13      tute of Standards and Technology shall ensure that no in-  
14      formation that is classified is included in any publicly re-  
15      leased version of the report required by this section.

16      (d) AUTHORIZATION OF APPROPRIATIONS.—There  
17      are authorized to be appropriated to the Secretary of Com-  
18      merce for the National Institute of Standards and Tech-  
19      nology for the purposes of carrying out this section,  
20      \$700,000.

○