113TH CONGRESS 2D SESSION

H.R. 2495

AN ACT

- To amend the Department of Energy High-End Computing Revitalization Act of 2004 to improve the high-end computing research and development program of the Department of Energy, 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,

1 SECTION 1. SHORT TITLE.

- This Act may be cited as the "American Super Com-
- 3 puting Leadership Act".
- 4 SEC. 2. DEFINITIONS.
- 5 Section 2 of the Department of Energy High-End
- 6 Computing Revitalization Act of 2004 (15 U.S.C. 5541)
- 7 is amended by striking paragraphs (1) through (5) and
- 8 inserting the following:
- 9 "(1) Co-design' means
- the joint development of application algorithms,
- models, and codes with computer technology archi-
- tectures and operating systems to maximize effective
- use of high-end computing systems.
- 14 "(2) Department.—The term 'Department'
- means the Department of Energy.
- 16 "(3) Exascale.—The term 'exascale' means
- 17 computing system performance at or near 10 to the
- 18 18th power floating point operations per second.
- 19 "(4) High-end computing system.—The
- term 'high-end computing system' means a com-
- 21 puting system with performance that substantially
- exceeds that of systems that are commonly available
- for advanced scientific and engineering applications.
- 24 "(5) Institution of higher education.—
- The term 'institution of higher education' has the

1	meaning given the term in section 101(a) of the						
2	Higher Education Act of 1965 (20 U.S.C. 1001(a))						
3	"(6) Leadership system.—The term 'leader						
4	ship system' means a high-end computing system						
5	that is among the most advanced in the world i						
6	terms of performance in solving scientific and eng						
7	neering problems.						
8	"(7) NATIONAL LABORATORY.—The term 'Na						
9	tional Laboratory' means any one of the seventeer						
10	laboratories owned by the Department.						
11	"(8) Secretary.—The term 'Secretary' mean						
12	the Secretary of Energy.						
13	"(9) Software technology.—The term						
14	'software technology' includes optimal algorithms,						
15	programming environments, tools, languages, and						
16	operating systems for high-end computing systems."						
17	SEC. 3. DEPARTMENT OF ENERGY HIGH-END COMPUTING						
18	RESEARCH AND DEVELOPMENT PROGRAM.						
19	Section 3 of the Department of Energy High-End						
20	Computing Revitalization Act of 2004 (15 U.S.C. 5542)						
21	is amended—						
22	(1) in subsection (a)—						
23	(A) in paragraph (1), by striking "pro-						
24	gram" and inserting "coordinated program						
25	across the Department";						

1	(B) by striking "and" at the end of para-
2	graph (1);
3	(C) by striking the period at the end of
4	paragraph (2) and inserting "; and; and
5	(D) by adding at the end the following new
6	paragraph:
7	"(3) partner with universities, National Labora-
8	tories, and industry to ensure the broadest possible
9	application of the technology developed in this pro-
10	gram to other challenges in science, engineering,
11	medicine, and industry.";
12	(2) in subsection $(b)(2)$, by striking "vector"
13	and all that follows through "architectures" and in-
14	serting "computer technologies that show promise of
15	substantial reductions in power requirements and
16	substantial gains in parallelism of multicore proc-
17	essors, concurrency, memory and storage, band-
18	width, and reliability"; and
19	(3) by striking subsection (d) and inserting the
20	following:
21	"(d) Exascale Computing Program.—
22	"(1) In General.—The Secretary shall con-
23	duct a coordinated research program to develop
24	exascale computing systems to advance the missions
25	of the Department.

1	"(2) Execution.—The Secretary shall,
2	through competitive merit review, establish two or
3	more National Laboratory-industry-university part-
4	nerships to conduct integrated research, develop-
5	ment, and engineering of multiple exascale architec-
6	tures, and—
7	"(A) conduct mission-related co-design ac-
8	tivities in developing such exascale platforms;
9	"(B) develop those advancements in hard-
10	ware and software technology required to fully
11	realize the potential of an exascale production
12	system in addressing Department target appli-
13	cations and solving scientific problems involving
14	predictive modeling and simulation and large-
15	scale data analytics and management; and
16	"(C) explore the use of exascale computing
17	technologies to advance a broad range of
18	science and engineering.
19	"(3) Administration.—In carrying out this
20	program, the Secretary shall—
21	"(A) provide, on a competitive, merit-re-
22	viewed basis, access for researchers in United
23	States industry, institutions of higher edu-
24	cation, National Laboratories, and other Fed-

eral agencies to these exascale systems, as appropriate; and

"(B) conduct outreach programs to increase the readiness for the use of such platforms by domestic industries, including manufacturers.

"(4) Reports.—

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"(A) Integrated strategy and pro-MANAGEMENT PLAN.—The Secretary shall submit to Congress, not later than 90 days after the date of enactment of the American Super Computing Leadership Act, a report outlining an integrated strategy and program management plan, including target dates for prototypical and production exascale platforms, interim milestones to reaching these targets, functional requirements, roles and responsibilities of National Laboratories and industry, acquisition strategy, and estimated resources required, to achieve this exascale system capability. The report shall include the Secretary's plan for Departmental organization to manage and execute the Exascale Computing Program, including definition of the roles and responsibilities within the Department to ensure an inte-

1	grated program across the Department. The re-
2	port shall also include a plan for ensuring bal-
3	ance and prioritizing across ASCR subprograms
4	in a flat or slow-growth budget environment.
5	"(B) STATUS REPORTS.—At the time of
6	the budget submission of the Department for
7	each fiscal year, the Secretary shall submit a
8	report to Congress that describes the status of
9	milestones and costs in achieving the objectives
10	of the exascale computing program.
11	"(C) Exascale merit report.—At least
12	18 months prior to the initiation of construction
13	or installation of any exascale-class computing
14	facility, the Secretary shall transmit a plan to
15	the Congress detailing—
16	"(i) the proposed facility's cost projec-
17	tions and capabilities to significantly accel-
18	erate the development of new energy tech-
19	nologies;
20	"(ii) technical risks and challenges
21	that must be overcome to achieve success-
22	ful completion and operation of the facility;
23	and
24	"(iii) an independent assessment of
25	the scientific and technological advances

expected from such a facility relative to
those expected from a comparable investment in expanded research and applications at terascale-class and petascale-class
computing facilities, including an evaluation of where investments should be made
in the system software and algorithms to
enable these advances.".

Passed the House of Representatives September 8, 2014.

Attest:

Clerk.

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