

***In the Senate of the United States,***

*December 8, 2022.*

*Resolved*, That the bill from the House of Representatives (H.R. 7535) entitled “An Act to encourage the migration of Federal Government information technology systems to quantum-resistant cryptography, and for other purposes.”, do pass with the following

**AMENDMENT:**

Strike all after the enacting clause and insert the following:

1 ***SECTION 1. SHORT TITLE.***

2 *This Act may be cited as the “Quantum Computing*  
3 *Cybersecurity Preparedness Act”.*

4 ***SEC. 2. FINDINGS; SENSE OF CONGRESS.***

5 *(a) FINDINGS.—Congress finds the following:*

6 *(1) Cryptography is essential for the national se-*  
7 *curity of the United States and the functioning of the*  
8 *economy of the United States.*

1           (2) *The most widespread encryption protocols*  
2 *today rely on computational limits of classical com-*  
3 *puters to provide cybersecurity.*

4           (3) *Quantum computers might one day have the*  
5 *ability to push computational boundaries, allowing us*  
6 *to solve problems that have been intractable thus far,*  
7 *such as integer factorization, which is important for*  
8 *encryption.*

9           (4) *The rapid progress of quantum computing*  
10 *suggests the potential for adversaries of the United*  
11 *States to steal sensitive encrypted data today using*  
12 *classical computers, and wait until sufficiently pow-*  
13 *erful quantum systems are available to decrypt it.*

14       (b) *SENSE OF CONGRESS.—It is the sense of Congress*  
15 *that—*

16           (1) *a strategy for the migration of information*  
17 *technology of the Federal Government to post-quant-*  
18 *um cryptography is needed; and*

19           (2) *the governmentwide and industrywide ap-*  
20 *proach to post-quantum cryptography should*  
21 *prioritize developing applications, hardware intellec-*  
22 *tual property, and software that can be easily up-*  
23 *dated to support cryptographic agility.*

24 **SEC. 3. DEFINITIONS.**

25       *In this Act:*

1           (1) *AGENCY*.—The term “agency”—

2                   (A) means any executive department, mili-  
3                   tary department, Government corporation, Gov-  
4                   ernment controlled corporation, or other estab-  
5                   lishment in the executive branch of the Govern-  
6                   ment (including the Executive Office of the  
7                   President), or any independent regulatory agen-  
8                   cy; and

9                   (B) does not include—

10                   (i) the Government Accountability Of-  
11                   fice; or

12                   (ii) the governments of the District of  
13                   Columbia and of the territories and posses-  
14                   sions of the United States, and their various  
15                   subdivisions.

16           (2) *CLASSICAL COMPUTER*.—The term “classical  
17           computer” means a device that accepts digital data  
18           and manipulates the information based on a program  
19           or sequence of instructions for how data is to be proc-  
20           essed and encodes information in binary bits that can  
21           either be 0s or 1s.

22           (3) *DIRECTOR OF CISA*.—The term “Director of  
23           CISA” means the Director of the Cybersecurity and  
24           Infrastructure Security Agency.

1           (4) *DIRECTOR OF NIST.*—The term “Director of  
2 *NIST*” means the Director of the National Institute  
3 of Standards and Technology.

4           (5) *DIRECTOR OF OMB.*—The term “Director of  
5 *OMB*” means the Director of the Office of Manage-  
6 ment and Budget.

7           (6) *INFORMATION TECHNOLOGY.*—The term “in-  
8 formation technology” has the meaning given the term  
9 in section 3502 of title 44, United States Code.

10          (7) *NATIONAL SECURITY SYSTEM.*—The term  
11 “national security system” has the meaning given the  
12 term in section 3552 of title 44, United States Code.

13          (8) *POST-QUANTUM CRYPTOGRAPHY.*—The term  
14 “post-quantum cryptography” means those cryp-  
15 tographic algorithms or methods that are assessed not  
16 to be specifically vulnerable to attack by either a  
17 quantum computer or classical computer.

18          (9) *QUANTUM COMPUTER.*—The term “quantum  
19 computer” means a computer that uses the collective  
20 properties of quantum states, such as superposition,  
21 interference, and entanglement, to perform calcula-  
22 tions.

23 **SEC. 4. INVENTORY OF CRYPTOGRAPHIC SYSTEMS; MIGRA-**  
24 **TION TO POST-QUANTUM CRYPTOGRAPHY.**

25          (a) *INVENTORY.*—

1           (1) *ESTABLISHMENT.*—Not later than 180 days  
2 after the date of enactment of this Act, the Director  
3 of OMB, in coordination with the National Cyber Di-  
4 rector and in consultation with the Director of CISA,  
5 shall issue guidance on the migration of information  
6 technology to post-quantum cryptography, which shall  
7 include at a minimum—

8           (A) a requirement for each agency to estab-  
9 lish and maintain a current inventory of infor-  
10 mation technology in use by the agency that is  
11 vulnerable to decryption by quantum computers,  
12 prioritized using the criteria described in sub-  
13 paragraph (B);

14           (B) criteria to allow agencies to prioritize  
15 their inventory efforts; and

16           (C) a description of the information re-  
17 quired to be reported pursuant to subsection (b).

18           (2) *ADDITIONAL CONTENT IN GUIDANCE.*—In the  
19 guidance established by paragraph (1), the Director of  
20 OMB shall include, in addition to the requirements  
21 described in that paragraph—

22           (A) a description of information technology  
23 to be prioritized for migration to post-quantum  
24 cryptography; and

1                   (B) a process for evaluating progress on mi-  
2                   grating information technology to post-quantum  
3                   cryptography, which shall be automated to the  
4                   greatest extent practicable.

5                   (3) *PERIODIC UPDATES.*—The Director of OMB  
6                   shall update the guidance required under paragraph  
7                   (1) as the Director of OMB determines necessary, in  
8                   coordination with the National Cyber Director and in  
9                   consultation with the Director of CISA.

10                  (b) *AGENCY REPORTS.*—Not later than 1 year after the  
11                  date of enactment of this Act, and on an ongoing basis  
12                  thereafter, the head of each agency shall provide to the Di-  
13                  rector of OMB, the Director of CISA, and the National  
14                  Cyber Director—

15                   (1) the inventory described in subsection (a)(1);

16                  and

17                   (2) any other information required to be reported  
18                  under subsection (a)(1)(C).

19                  (c) *MIGRATION AND ASSESSMENT.*—Not later than 1  
20                  year after the date on which the Director of NIST has issued  
21                  post-quantum cryptography standards, the Director of  
22                  OMB shall issue guidance requiring each agency to—

23                   (1) prioritize information technology described  
24                  under subsection (a)(2)(A) for migration to post-  
25                  quantum cryptography; and

1           (2) *develop a plan to migrate information tech-*  
2           *nology of the agency to post-quantum cryptography*  
3           *consistent with the prioritization under paragraph*  
4           *(1).*

5           (d) *INTEROPERABILITY.—The Director of OMB shall*  
6           *ensure that the prioritizations made under subsection (c)(1)*  
7           *are assessed and coordinated to ensure interoperability.*

8           (e) *OFFICE OF MANAGEMENT AND BUDGET RE-*  
9           *PORTS.—*

10           (1) *REPORT ON POST-QUANTUM CRYPTO-*  
11           *RAPHY.—Not later than 15 months after the date of*  
12           *enactment of this Act, the Director of OMB, in coordi-*  
13           *nation with the National Cyber Director and in con-*  
14           *sultation with the Director of CISA, shall submit to*  
15           *the Committee on Homeland Security and Govern-*  
16           *mental Affairs of the Senate and the Committee on*  
17           *Oversight and Reform of the House of Representatives*  
18           *a report on the following:*

19                   (A) *A strategy to address the risk posed by*  
20                   *the vulnerabilities of information technology of*  
21                   *agencies to weakened encryption due to the po-*  
22                   *tential and possible capability of a quantum*  
23                   *computer to breach that encryption.*

24                   (B) *An estimate of the amount of funding*  
25                   *needed by agencies to secure the information*

1           *technology described in subsection (a)(1)(A) from*  
2           *the risk posed by an adversary of the United*  
3           *States using a quantum computer to breach the*  
4           *encryption of the information technology.*

5           *(C) A description of Federal civilian execu-*  
6           *tive branch coordination efforts led by the Na-*  
7           *tional Institute of Standards and Technology,*  
8           *including timelines, to develop standards for*  
9           *post-quantum cryptography, including any Fed-*  
10          *eral Information Processing Standards developed*  
11          *under chapter 35 of title 44, United States Code,*  
12          *as well as standards developed through vol-*  
13          *untary, consensus standards bodies such as the*  
14          *International Organization for Standardization.*

15          (2) *REPORT ON MIGRATION TO POST-QUANTUM*  
16          *CRYPTOGRAPHY IN INFORMATION TECHNOLOGY.—Not*  
17          *later than 1 year after the date on which the Director*  
18          *of OMB issues guidance under subsection (c)(2), and*  
19          *thereafter until the date that is 5 years after the date*  
20          *on which post-quantum cryptographic standards are*  
21          *issued, the Director of OMB, in coordination with the*  
22          *National Cyber Director and in consultation with the*  
23          *Director of CISA, shall submit to the Committee on*  
24          *Homeland Security and Governmental Affairs of the*  
25          *Senate and the Committee on Oversight and Reform*



1        *of the House of Representatives, with the report sub-*  
2        *mitted pursuant to section 3553(c) of title 44, United*  
3        *States Code, a report on the progress of agencies in*  
4        *adopting post-quantum cryptography standards.*

5        **SEC. 5. EXEMPTION OF NATIONAL SECURITY SYSTEMS.**

6        *This Act shall not apply to any national security sys-*  
7        *tem.*

8        **SEC. 6. DETERMINATION OF BUDGETARY EFFECTS.**

9        *The budgetary effects of this Act, for the purpose of*  
10       *complying with the Statutory Pay-As-You-Go Act of 2010,*  
11       *shall be determined by reference to the latest statement titled*  
12       *“Budgetary Effects of PAYGO Legislation” for this Act,*  
13       *submitted for printing in the Congressional Record by the*  
14       *Chairman of the House Budget Committee, provided that*  
15       *such statement has been submitted prior to the vote on pas-*  
16       *sage.*

Attest:

*Secretary.*

117<sup>TH</sup> CONGRESS  
2<sup>D</sup> SESSION

**H.R. 7535**

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**AMENDMENT**