

117TH CONGRESS
2^D SESSION

H. R. 7535

IN THE SENATE OF THE UNITED STATES

JULY 13, 2022

Received; read twice and referred to the Committee on Homeland Security and
Governmental Affairs

AN ACT

To encourage the migration of Federal Government information technology systems to quantum-resistant cryptography, 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.**

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

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

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

6 (1) Cryptography is essential for the national
7 security of the United States and the functioning of
8 the economy of the United States.

9 (2) The most widespread encryption protocols
10 today rely on computational limits of classical com-
11 puters to provide cybersecurity.

12 (3) Quantum computers might one day have the
13 ability to push computational boundaries, allowing
14 us to solve problems that have been intractable thus
15 far, such as integer factorization, which is important
16 for encryption.

17 (4) The rapid progress of quantum computing
18 suggests the potential for adversaries of the United
19 States to steal sensitive encrypted data today using
20 classical computers, and wait until sufficiently pow-
21 erful quantum systems are available to decrypt it.

22 (b) SENSE OF CONGRESS.—It is the sense of Con-
23 gress that—

24 (1) a strategy for the migration of information
25 technology systems of the Federal Government to
26 post-quantum cryptography is needed; and

1 (2) the Governmentwide and industrywide ap-
2 proach to post-quantum cryptography should
3 prioritize developing applications, hardware intellec-
4 tual property, and software that can be easily up-
5 dated to support cryptographic agility.

6 **SEC. 3. INVENTORY OF CRYPTOGRAPHIC SYSTEMS; MIGRA-**
7 **TION TO POST-QUANTUM CRYPTOGRAPHY.**

8 (a) INVENTORY.—

9 (1) ESTABLISHMENT.—Not later than 180 days
10 after the date of the enactment of this Act, the Di-
11 rector of OMB shall establish, by rule or binding
12 guidance, a requirement for each executive agency to
13 establish and maintain an inventory of each cryp-
14 tographic system in use by the agency.

15 (2) ADDITIONAL CONTENT IN RULE OR BIND-
16 ING GUIDANCE.—In the rule or binding guidance es-
17 tablished by paragraph (1), the Director of OMB
18 shall include, in addition to the requirement de-
19 scribed under such paragraph—

20 (A) a description of information technology
21 to be prioritized for migration to post-quantum
22 cryptography;

23 (B) a description of the information re-
24 quired to be reported pursuant to subsection
25 (b); and

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

5 (3) PERIODIC UPDATES.—The Director of OMB
6 shall update the rule or binding guidance established
7 by paragraph (1) as the Director determines necessary.
8

9 (b) AGENCY REPORTS.—Not later than 1 year after
10 the date of the enactment of this Act, and on an ongoing
11 basis thereafter, the head of each executive agency shall
12 provide to the Director of OMB, the Director of CISA,
13 and the National Cyber Director an inventory of all information
14 technology in use by the executive agency that is
15 vulnerable to decryption by quantum computers.

16 (c) MIGRATION AND ASSESSMENT.—

17 (1) MIGRATION TO POST-QUANTUM CRYPTOGRAPHY.—Not later than 1 year after the date on
18 which the Director of NIST has issued post-quantum
19 cryptography standards, the Director of OMB
20 shall issue guidance requiring each executive agency
21 to develop a plan, including interim benchmarks, to
22 migrate information technology of the agency to
23 post-quantum cryptography.
24

1 (2) DESIGNATION OF SYSTEMS FOR MIGRA-
2 TION.—Not later than 90 days after the date on
3 which the guidance required by paragraph (1) has
4 been issued, the Director of OMB shall issue guid-
5 ance for agencies to—

6 (A) designate information technology to be
7 migrated to post-quantum cryptography; and

8 (B) prioritize information technology des-
9 ignated under subparagraph (A), on the basis
10 of the amount of risk posed by decryption by
11 quantum computers to such technology, for mi-
12 gration to post-quantum cryptography.

13 (d) INTEROPERABILITY.—The Director of OMB shall
14 ensure that the designations and prioritizations made
15 under subsection (c)(2) are assessed and coordinated to
16 ensure interoperability.

17 (e) REPORT ON POST-QUANTUM CRYPTOGRAPHY.—
18 Not later than 15 months after the date of the enactment
19 of this Act, the Director of OMB shall submit to Congress
20 a report on the following:

21 (1) A strategy to address the risk posed by the
22 vulnerabilities of information technology systems of
23 executive agencies to weakened encryption due to the
24 potential and possible capability of a quantum com-
25 puter to breach such encryption.

1 (2) The amount of funding needed by executive
2 agencies to secure such information technology sys-
3 tems from the risk posed by an adversary of the
4 United States using a quantum computer to breach
5 the encryption of information technology systems.

6 (3) A description of Federal civilian executive
7 branch coordination efforts led by the National In-
8 stitute of Standards and Technology, including
9 timelines, to develop standards for post-quantum
10 cryptography, including any Federal Information
11 Processing Standards developed under chapter 35 of
12 title 44, United States Code, as well as standards
13 developed through voluntary, consensus standards
14 bodies such as the International Organization for
15 Standardization.

16 (f) REPORT ON MIGRATION TO POST-QUANTUM
17 CRYPTOGRAPHY IN INFORMATION TECHNOLOGY SYS-
18 TEMS.—Not later than 1 year after the date on which the
19 Director of OMB issues guidance under subsection (c)(2),
20 and annually thereafter until the date that is 5 years after
21 the date on which post-quantum cryptographic standards
22 are issued, the Director of OMB shall submit to Congress,
23 with the report submitted pursuant to section 3553(e) of
24 title 44, United States Code, a report on the progress of

1 executive agencies in adopting post-quantum cryptography
2 standards.

3 (g) DEFINITIONS.—In this Act:

4 (1) CLASSICAL COMPUTER.—The term “clas-
5 sical computer” means a device that accepts digital
6 data and manipulates the information based on a
7 program or sequence of instructions for how data is
8 to be processed and encodes information in binary
9 bits that can either be 0s or 1s.

10 (2) DIRECTOR OF NIST.—The term “Director
11 of NIST” means the Director of the National Insti-
12 tute of Standards and Technology.

13 (3) DIRECTOR OF OMB.—The term “Director of
14 OMB” means the Director of the Office of Manage-
15 ment and Budget.

16 (5) EXECUTIVE AGENCY.—The term “executive
17 agency” has the meaning given the term “Executive
18 agency” in section 105 of title 5, United States
19 Code.

20 (6) INFORMATION TECHNOLOGY.—The term
21 “information technology” has the meaning given
22 that term in section 3502 of title 44, United States
23 Code.

1 (7) POST-QUANTUM CRYPTOGRAPHY.—The
2 term “post-quantum cryptography” means a cryp-
3 tographic system that—

4 (A) is secure against decryption attempts
5 using a quantum computer or classical com-
6 puter; and

7 (B) can interoperate with existing commu-
8 nications protocols and networks.

9 (8) QUANTUM COMPUTER.—The term “quan-
10 tum computer” means a computer that uses the col-
11 lective properties of quantum states to perform cal-
12 culations.

13 **SEC. 4. DETERMINATION OF BUDGETARY EFFECTS.**

14 The budgetary effects of this Act, for the purpose of
15 complying with the Statutory Pay-As-You-Go Act of 2010,
16 shall be determined by reference to the latest statement
17 titled “Budgetary Effects of PAYGO Legislation” for this
18 Act, submitted for printing in the Congressional Record
19 by the Chairman of the House Budget Committee,

- 1 provided that such statement has been submitted prior to
- 2 the vote on passage.

Passed the House of Representatives July 12, 2022.

Attest: CHERYL L. JOHNSON,
Clerk.