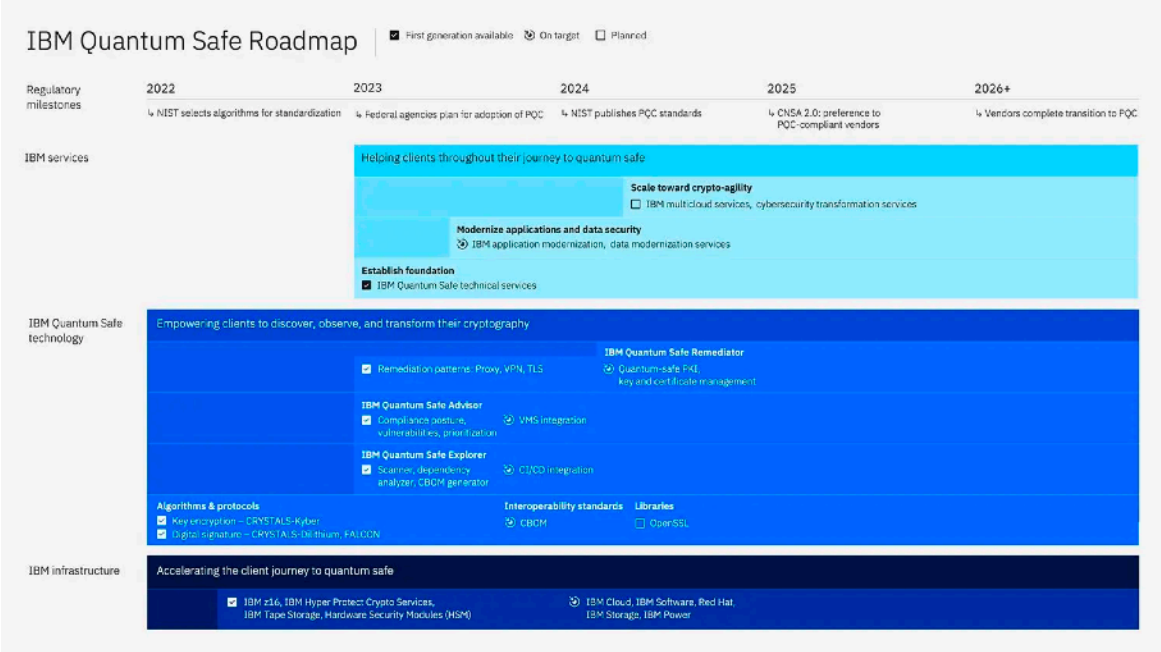
VOL. 34 JUNE 2023

NTU Q

SELECTED NEWS

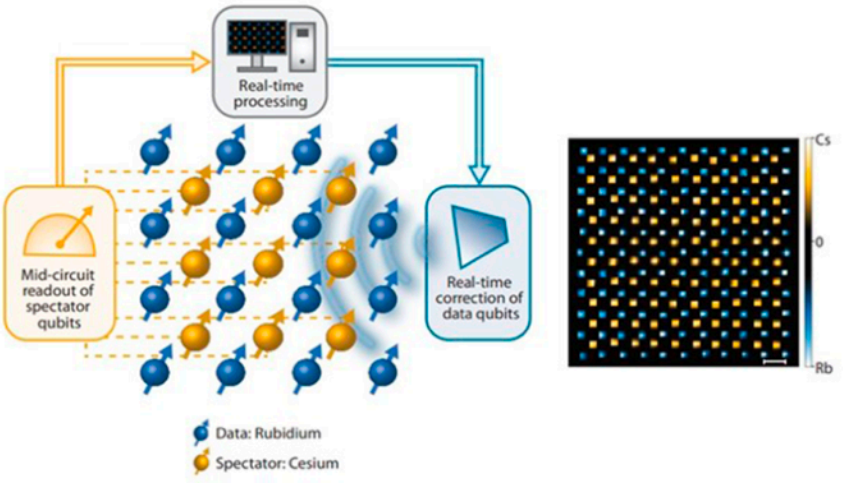
How IBM Quantum is bringing organizations along their quantum-safe technology journey



Practical quantum computing solutions could impact computing strategies across industries by the decade's end. But it will also profoundly alter how we secure our digital data fabric through cryptography. Organizations are already examining how to upgrade their cybersecurity to prepare for this new computational era.

IBM has announced its quantum-safe roadmap to equip industries with cybersecurity capabilities for the quantum computing era. They have introduced IBM Quantum Safe technology, which includes tools, capabilities, and approaches to ensure organizations' transition to quantum safety. The roadmap comprises three stages: Discover, Observe, and Transform. To aid these stages, IBM has developed three technologies: Quantum-Safe Explorer for discovering cryptographic usage, Quantum-Safe Advisor for observing cryptographic compliance and vulnerabilities, and Quantum-Safe Remediator for transitioning systems to quantum safety. The roadmap aligns with the imminent introduction of post-quantum cryptographic standards by NIST and the NSA's mandate for quantum-safe algorithms in national security systems by 2025.

Noise-canceling qubits can minimize errors in quantum computers



Despite their immense promise to solve new kinds of problems, today's quantum computers are inherently prone to error. A small perturbation in their surrounding environment— a change in temperature, pressure, or magnetic field, for instance —can disrupt their fragile computational building blocks, called qubits.

Researchers at the University of Chicago's Pritzker School of Molecular Engineering have developed a novel method to minimize errors in quantum systems by continuously monitoring environmental noise. The method involves using spectator qubits, which are embedded in the quantum computer for the sole purpose of measuring external noise. This information is then used to adjust data-processing qubits, reducing noise and error. Likened to noise-canceling headphones, this system has shown promising initial results in a neutral atom quantum array, though more work is needed to improve its sensitivity. This innovative approach could eventually be implemented in the background of any quantum computer to minimize errors during data storage and computation.

SELECTED EVENTS

Qiskit Hackathon Taiwan 2023 is coming

This activity is open to all who interest in quantum computing! Registration will end on Jun 25th.

Qiskit Global Summer School 2023:Theory To Implementation

計畫補助單 NSTC 國家科學及技術委員會 National Science and Technology Council

IBM Quantum Computer Hub at National Taiwan University

Rm.711, Dept. of Physics /Center for Condensed Building

No. 1, Sec.4 Roosevelt Rd., Da'an Dist. Taipei City 106319, Taiwan

ntuq2018@gmail.com :+886 2-33669928 http://quantum.ntu.edu.tw/