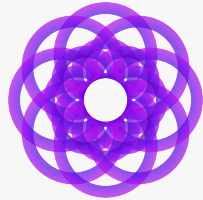


Q-CTRL Integrates Its Error Suppression Technology into IBM Quantum services

Q-CTRL's quantum infrastructure software for error suppression and performance management to run natively as an option on the IBM Quantum Pay-As-You-Go plan



Q-CTRL

LOS ANGELES, UNITED STATES,
November 28, 2023 /

EINPresswire.com/ -- Q-CTRL, a global leader in developing useful quantum technologies through quantum control infrastructure software, today announced that its [Q-CTRL Embedded](#) software has been integrated as an option with IBM Quantum's Pay-As-You-Go Plan to deliver

“

With this technology natively embedded within IBM Quantum services, we can get more value from current hardware and push our applications further,”

*Julian van Velzen, CTIO &
Head of Quantum Lab at
Capgemini*

advancements in quantum computing utility and performance. This integration represents the first time a third-party independent software vendor's technology solution will be available for users to select in the IBM Quantum Pay-As-You-Go Plan.

The integration aims to provide user-friendly functionality to address the primary challenge facing quantum computing end-users: Unreliable results from algorithms run on today's hardware.

To get the most out of near-term quantum computers you need to be an expert in an array of technical specializations – algorithms, compilers, error suppression strategies, and error mitigation – without focusing on each of these it's difficult to get reliable results. The combination of Q-CTRL technology and IBM Quantum services reduces this burden, making it simpler to get useful results from real hardware by automatically addressing the problem of noise and hardware error.

Companies and end-users are seeking streamlined ways to integrate useful quantum computing into their workflows and to better leverage their existing IT expertise. Q-CTRL's state-of-the-art performance-management infrastructure software, Q-CTRL Embedded, delivers these benefits to users and will now be available as an option within the IBM Quantum Pay-As-You-Go Plan.

Now, any IBM Quantum Pay-As-You-Go Plan user has the option to utilize Q-CTRL's advanced

technology using a single command within their Qiskit environment. And in great news for the community, accessing Q-CTRL's performance-management software incurs no additional costs to the IBM Quantum Pay-As-You-Go Plan.

"Since we joined the IBM Quantum Network in 2018, we've been building the world's most advanced infrastructure software for performance management in quantum computing," said Q-CTRL CEO and Founder Michael J. Biercuk. "IBM has built a world-class quantum computing platform with the flexibility needed for experts like Q-CTRL to demonstrate new software able to dramatically improve the success of real quantum algorithms—detailed tests on a suite of benchmarking algorithms showed benefits up to thousands of times. We're very excited to now bring these tools to the exceptional ecosystem of researchers and businesses building their quantum workflows on IBM hardware."



Q-CTRL Embedded delivers enhancements in computational accuracy and efficiency through a simple configuration-free setting. When the performance management option is selected, a fully configured autonomous toolchain is triggered in the background to suppress errors.

Based on recently [peer-reviewed research](#) on this topic and new tests on utility-scale quantum systems, benefits can reach up to:

- 10X increase in the complexity of quantum algorithms they can run (measured through circuit depth), up to intrinsic hardware limits;
- 100X cost reduction relative to alternative research-grade error-reduction strategies by reducing the number of experimental "shots" required to suppress errors;
- >1,000X improvement in the success of quantum algorithms widely used in the sector.

These functionalities, in combination with the IBM Quantum development roadmap, aim to accelerate the path toward quantum advantage and allow end users from research to enterprise to gain strategic advantages they've been seeking from their quantum applications.

"At IBM, our goal is to give our users the ability to run valuable quantum workloads beyond what can be simulated on classical computers. A core requirement to this is reducing noise. The noise suppression provided through Q-CTRL's performance management makes exploring useful

quantum circuits even easier. I very much look forward to what our users will be able to do with this newly added error-suppression technology," said Jay Gambetta, IBM Fellow and Vice President, IBM Quantum.

Alpha-test customers include quantum technology startups, large industrial partners including Airbus, and Big Four consulting firms. Already they're seeing meaningful value through the unlocking of latent hardware performance.

"We have previously explored Q-CTRL's performance management capabilities and were impressed by the order of magnitude improvement seen across both the inverse quantum Fourier transform and quantum phase estimation," said Julian van Velzen, CTIO & Head of Quantum Lab at Capgemini. "With this technology natively embedded within IBM Quantum services, we can get more value from current hardware and push our applications further."

Users can get started by accessing the Qiskit Runtime service on IBM Cloud [here](#).

About Q-CTRL

Q-CTRL's quantum control infrastructure software for R&D professionals and quantum computing end users delivers the highest performance error-correcting and suppressing techniques globally, and provides a unique capability accelerating the pathway to the first useful quantum computers and quantum sensors. Q-CTRL operates a globally leading quantum sensing division focused on software-level innovation for strategic capability. Q-CTRL also has developed Black Opal, an edtech platform that enables users to quickly learn quantum computing.

Founded by Michael J. Biercuk in 2017, Q-CTRL has pioneered the quantum infrastructure software segment, and has become the leading product-focused software company in the broader quantum sector. Q-CTRL has been an inaugural member of the IBM Quantum Network startup program since 2018, and its performance management software now runs natively on IBM Quantum computers. The company has international headquarters in Sydney, Los Angeles, Berlin, and London.

Additional alpha user experiences

One of the Big Four firms ran a compare-and-shift quantum gate algorithm for DNA sequencing and received a boost of 2x with the Q-CTRL's performance management over the default 14 qubit configuration, resulting from unlocked latent performance. Building on this, the firm was able to increase the circuit complexity, and with 26 qubits the combination of Q-CTRL's native integration with IBM Quantum returned useful solutions for the first time. With this improved user experience, they could see themselves utilizing this technology in the future to help solve some of their clients' hardest problems.

Airbus is currently testing the new Q-CTRL software solution as an alpha user. The aerospace leader is embracing quantum technologies as an early adopter and is actively exploring how

quantum computing can help solve future challenges for the aerospace sector.

Luke Keding

HKA Marketing Communications

+1 315-575-4491

[email us here](#)

This press release can be viewed online at: <https://www.einpresswire.com/article/671420681>

EIN Presswire's priority is source transparency. We do not allow opaque clients, and our editors try to be careful about weeding out false and misleading content. As a user, if you see something we have missed, please do bring it to our attention. Your help is welcome. EIN Presswire, Everyone's Internet News Presswire™, tries to define some of the boundaries that are reasonable in today's world. Please see our Editorial Guidelines for more information.

© 1995-2023 Newsmatics Inc. All Right Reserved.