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IBM Makes a Long Bet on Quantum Computing



NEWS ANALYSIS
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Executive Editor,
Light Reading
1/14/2019

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Don't expect your business to run on quantum computing this year. Or next year either.

Five years? That's likely, Anthony Annunziata, IBM Corp. (NYSE: IBM) Q Network Global Leader, tells Light Reading.

Or, more precisely, IBM sees the first commercial applications for quantum computing emerging in five years, probably in chemistry or materials science, he says. Other possible applications include financial data and global logistics.

Quantum computing is an emerging computer technology that uses a property called "quantum superposition" to allow its "qubits" to have greater complexity than the 0 or 1 state permitted to the bits that make up conventional computers. Quantum computers would be more powerful than conventional computers, challenging existing High Performance Computing (HPC). And quantum computers would be able to model systems of greater complexity than conventional computers, Annunziata says.

IBM explains quantum computing in this one-minute video:



Quantum computing is one of several technologies that IBM is betting will be big. Others include blockchain and artificial intelligence (where that bet is already beginning to pay off). But quantum computing is still a long way from arriving.

"While the technology has come a long way, what we can do with quantum computing is still exploratory," Annunziata says. "We still don't know what commercial applications of quantum computing will be."

He adds, "IBM wants to be in the forefront of any computing technology, and quantum computing will be a big part of the future of computing."

IBM hit a quantum computing milestone last week with the launch of Q System One, which it bills as the "world's first integrated, universal approximate quantum computing system designed for scientific and commercial use." Fully integrated means that all the components are designed to work together as a unit, not assembled out of disparate pieces as previous quantum computers have been, Annunziata says.

IBM CEO Ginni Rometty showcased the Q System One during her CES keynote last week. (See CES 2019: IBM CEO Touts 'What's Next' for Data, Computing.)

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9:15

Did you know that Netflix is almost 15% of all Internet downstream traffic worldwide? Or that Google services consume over 40% of all connections in Asia? Explore these data points and many more in Sandvine's 2018 Global Internet Phenomena ...



Norwegian Service Provider Deploys AirTies' Smart Wi-Fi

2:42

In this video, Frode Elverum, Head of Broadband at Get, a leading broadband provider in Norway, talks about using AirTies to supply its new, premium in-home Wi-Fi



The IBM Q System One, being assembled. Photo by IBM.

The quantum computer needs extremely cold temperatures to operate -- colder even than available in space. The quantum computer operates at 15 millikelvin -- 15 thousandths of a kelvin degree. Room temperature is 293 kelvin, ice melts at 273.15 kelvin and water boils at 373.15 kelvin.

The System One is housed in a nine-foot by nine-foot case of half-inch-thick borosilicate glass forming a sealed, airtight exposure. It opens using a technique IBM calls "roto-translation" for maintenance and upgrades minimizing downtime.

Organizations can access System One over the cloud, IBM says.

Additionally, IBM is expanding its quantum computing research partnership, which it calls the IBM Q Network, with five new members: Argonne National Laboratory, CERN, ExxonMobil, Fermilab, and Lawrence Berkeley National Laboratory. (See [IBM Q Network Opens Up Quantum Computing to Researchers, Businesses.](#))

And IBM will open a Q Quantum Computation Center in Poughkeepsie, New York, for commercial use of quantum computing.

IBM isn't alone in developing quantum computing; Wikipedia's [list of companies involved in quantum computing or communication](#) has more than 50 entries.

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