



Quantum Contracts

An On-chain Quantum Emulator on Polygon

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Is Web3 Quantum- Ready?



Quantum computing is being used in simulations, optimizations and machine-learning in other industries



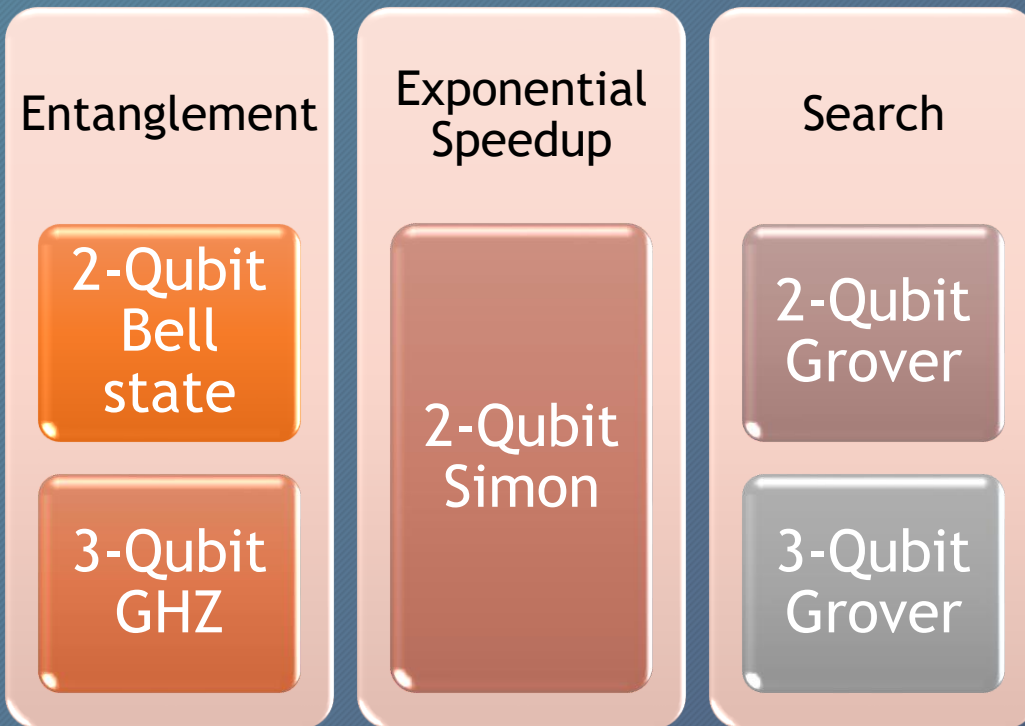
Platforms from IBM, Microsoft, AWS, Regetti are already providing quantum tools and services on the cloud



But do we know of quantum use-cases in Web3?

Do Web3 programmers even know where to start?

Recall Last Week



- v0.1 Features
 - Supports up to 4 Qubits
 - Supports the following gates:
 - I = Identity Gate
 - X = Not Gate
 - H = Hadamard Gate
 - CN = Control-Not Gate
 - CCN = Toffoli Gate
 - Quantum circuit is interpreted (not compiled)

This Week

- A on-chain quantum emulator running in a smartcontract
- runQScript API:
 - Input : Number of Qubits + Quantum circuit
 - Output : Computation result
- On Mumbai testnet
 - Written in solidity as a view function (no gas needed)
 - Source on Github
- v0.2 Features
 - Supports up to 8 Qubits
 - Universal Quantum Computer
 - I,X,H,CN,CCN
 - **Pauli-Y,Z Gates**
 - **Phase shift $P \frac{\pi}{4}$ and $T \frac{\pi}{8}$ Gates**
 - Able to run Shor's Algorithm
 - DApp hosted on github to support user testing
 - Subscription Business Model

Demo

tanteikg.github.io/QC

On-chain Quantum Computing

Try out the world's first fully on-chain quantum emulator running on Polygon POS testnet

Choose a circuit:

GHZ 3 Qubit

Number of Qubits:

3

Result: 7 (Binary: 111)

Number of Qubits: 1 to 8

Enter Circuit:

HII,CNI,ICN.

 Tweet

Run Circuit

Available Gates:

X,Y,Z : Pauli-X,Y,Z gate

H : Hadamard gate

CN : Control Not / Toffoli gate

P,T : Phase shift $\pi/2$ and $\pi/4$ gate

I,m : Identity and measure gate

, : Intermediate delimiter

.. : End of circuit

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Proposed Business Model

- Freemium Subscription Model
 - No charge for 4(?) qubits or less
 - Subscription is based on X MATIC per timeblock.
- Value Added Services
 - Design and consultancy of Quantum circuits for optimization and entanglement use-cases
 - Connection to real quantum computer
- Next Steps
 - More testing and code validation
 - Launch + other support from Jump/Polygon?

Comments/Questions

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