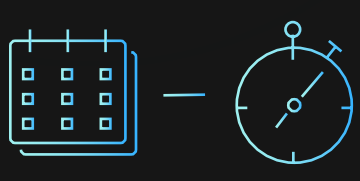
The quantum decade

Preparing for the next computing revolution

The power of quantum computing

Quantum computing promises exponentially faster speeds for certain classes of simulation, algebraic, and search problems. It may shorten such calculations from **years to minutes.**



The road to quantum advantage

Quantum science
- Creating the theoretical and physical building blocks of quantum computing

Quantum ready
- Preparing for the quantum computing era

1960s — 2016 — 2020s — 2050+

Quantum advantage
Solving real-world problems with greater speed and accuracy

What makes this the quantum decade?

Mounting pressure to solve exponential problems

- Discovery of new materials
- Managing complex financial risk
- Re-engineering supply chains for resilience

Quantum technology at a tipping point

- Hardware scaling from 127 qubits in 2021 to 1 million qubits by 2030
- Software developments for frictionless quantum computing
- Algorithm improvements and greater circuit quality, complexity, and variety

Quantum ecosystems scaling

- Open innovation fosters collaborative learning
- Users trained to apply quantum computing to real-world problems
- > 1B circuits run per day in the Qiskit community

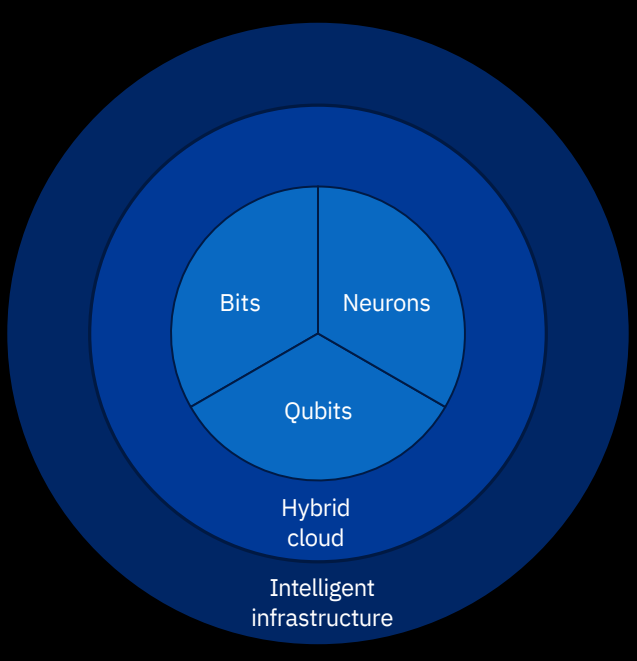
The most exciting computing revolution in 60 years

3 major technologies are converging

- **Bits:** Classical high performance computing systems
- **Neurons:** AI systems
- **Qubits:** Quantum systems

Hybrid cloud
Secure, heterogeneous computational fabric

Intelligent infrastructure
Integration of the 3 technologies

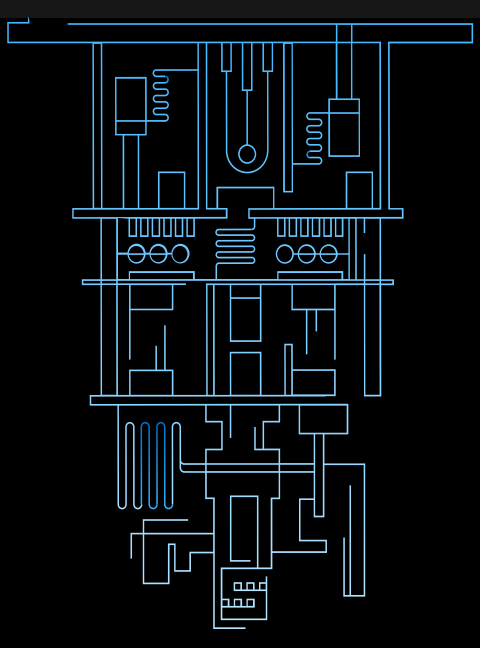


Immediate actions for success in the quantum decade

Enable
quantum-ready workflows

Prioritize
industry-specific use cases

Grow
a quantum-literate workforce



New report to be released in early 2021. Access the full portfolio of quantum computing thought leadership from the IBM Institute for Business Value.

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