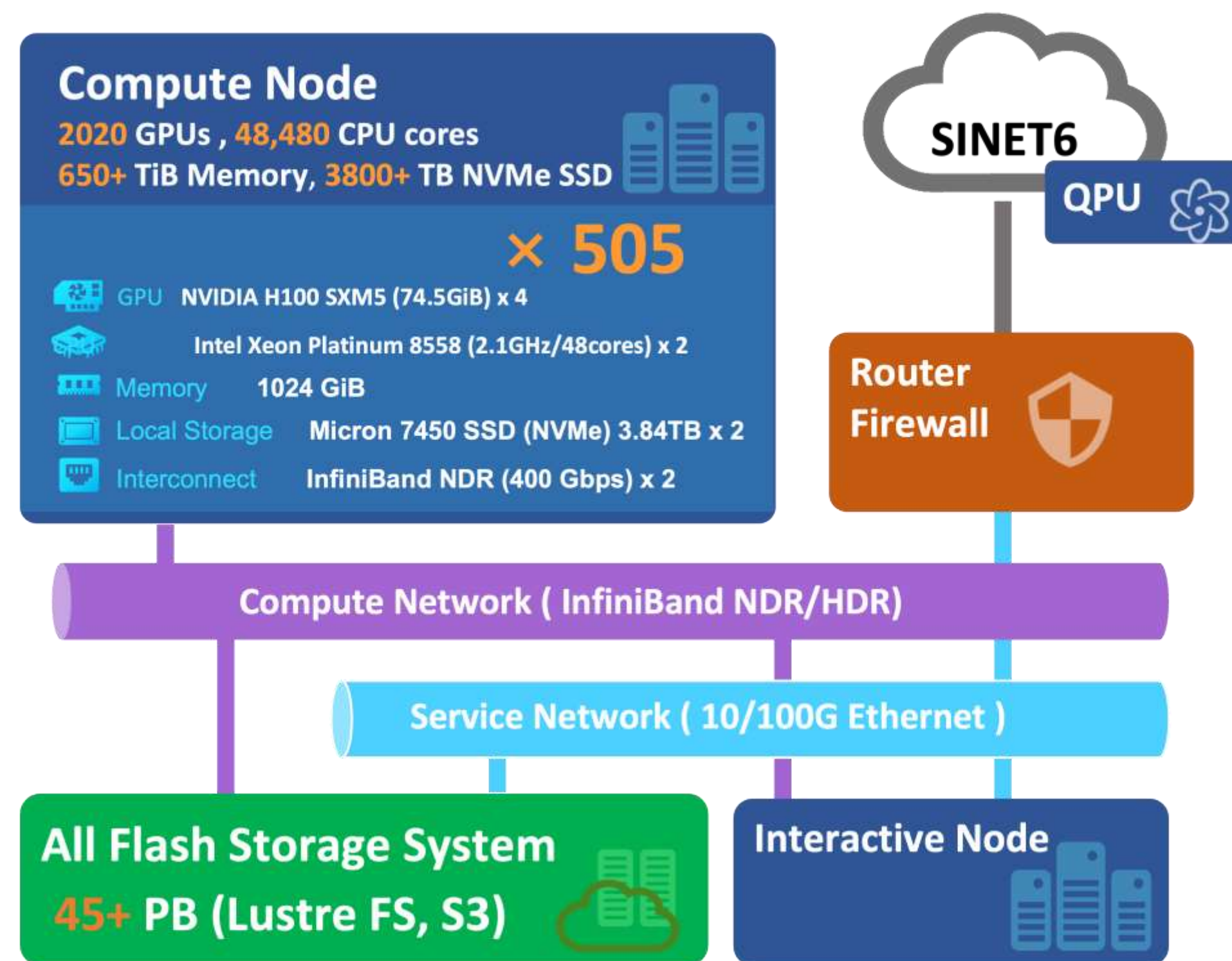


ABCI-Q

Quantum-Classical Hybrid Computing Infrastructure

- ▶ A testbed for experimenting with various quantum computing technologies
- ▶ A classical computing infrastructure that interacts with cloud and on-premises QC
- ▶ Contributing to the creation of use cases for quantum technologies that can be implemented in society

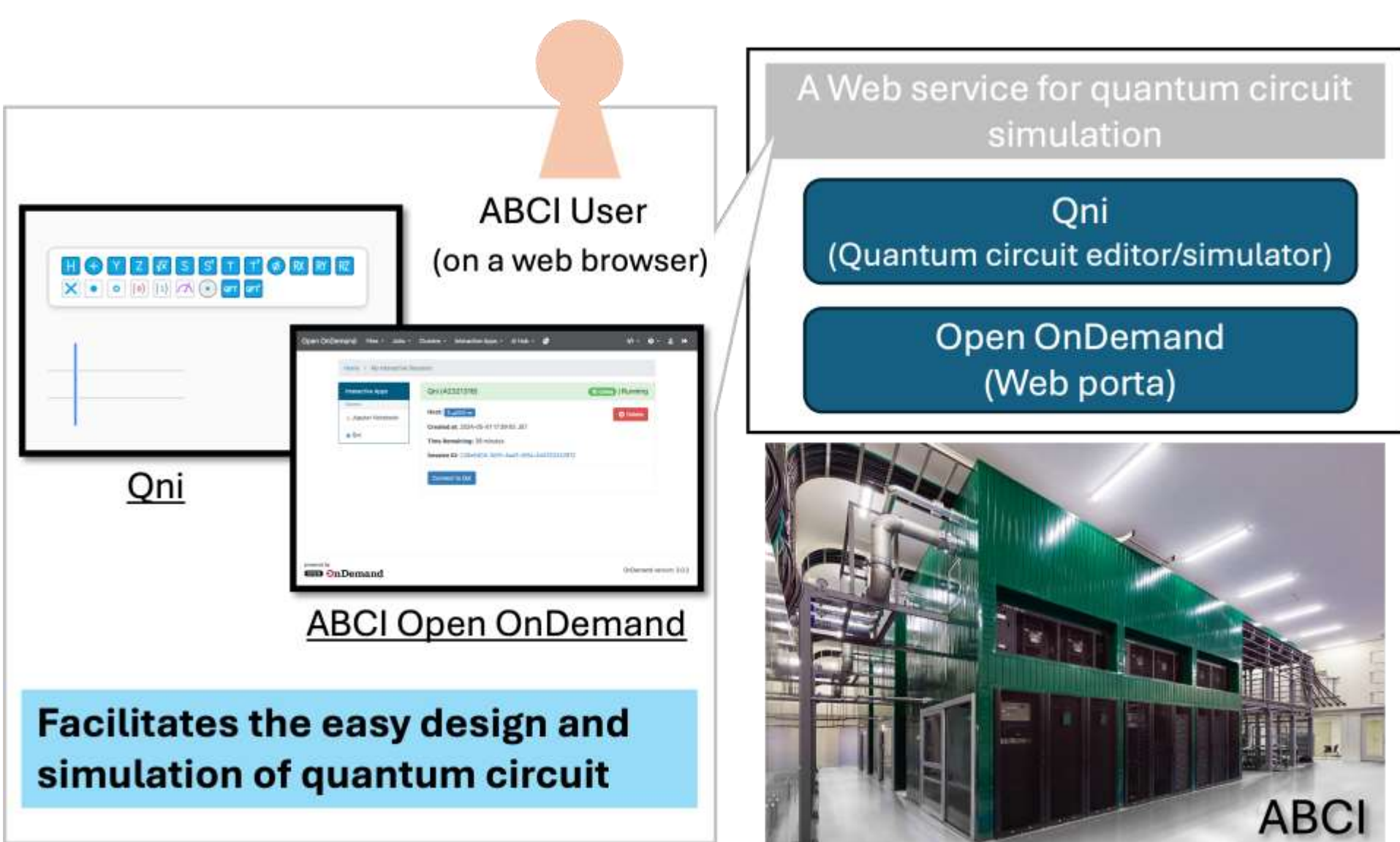
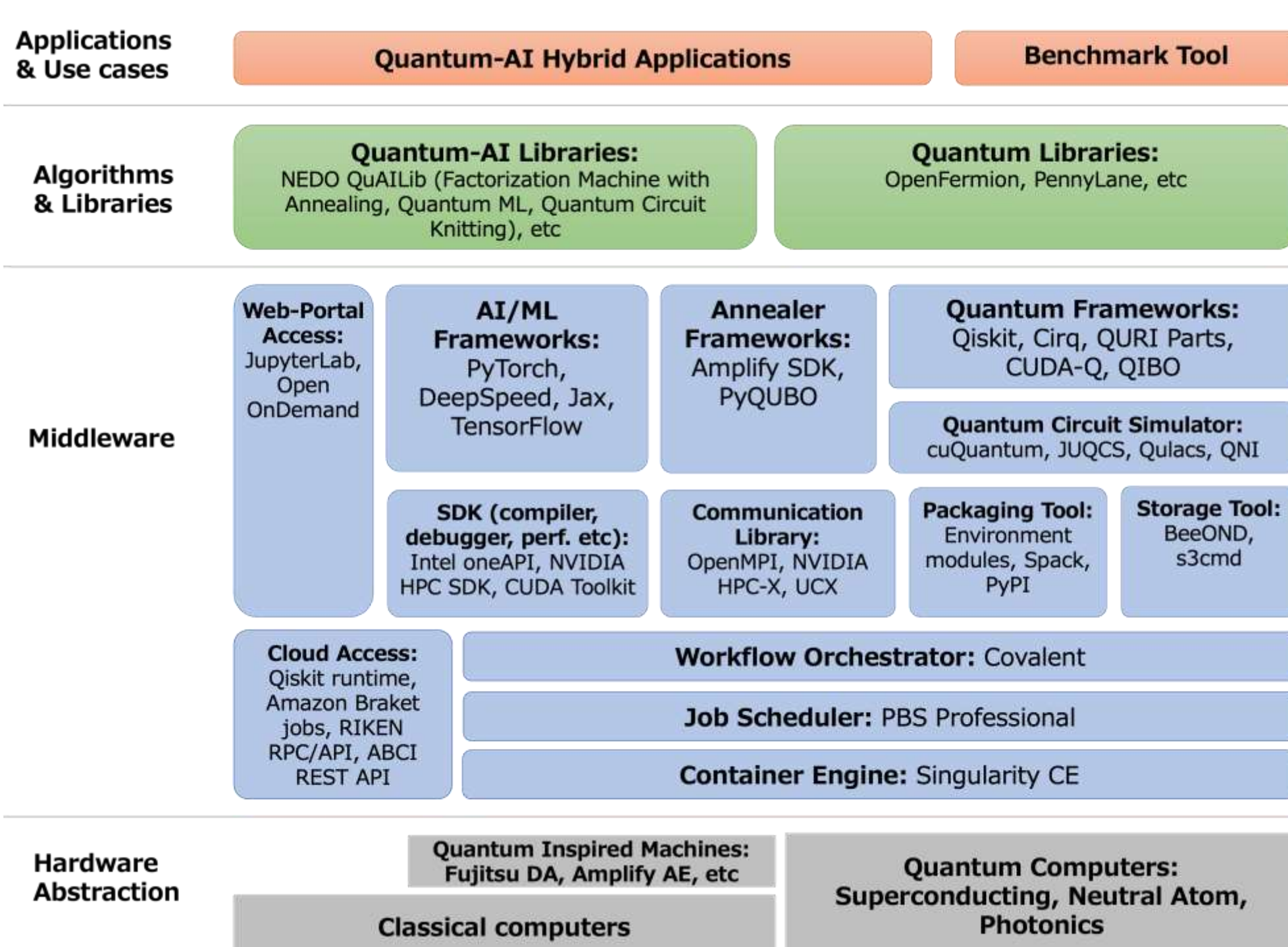


ABCI-Q Hardware

- A large-scale HPC system composed of commodity hardware
- AI performance (bf16): 2.1 EFLOPS
- HPC/Simulation performance (fp64): 138.4 PFLOPS
- Provide a **quantum-classical hybrid computing environment** in collaboration with various quantum computers
 - High-speed communication with three types of on-premises quantum computers
 - Neutral atom, superconducting and photonic
 - Internet access to the cloud quantum computers via academic networks

ABCI-Q Software

- Deploy quantum and AI software libraries based on the widely adopted software stack in HPC systems
- Provide GPU-based quantum circuit simulators and quantum annealing engines
 - Simulator: NVIDIA cuQuantum Appliance
 - Annealing engine: Fujitsu Digital Annealer, Fixstars Amplify AE
- Introduce a workflow tool for developing quantum-classical hybrid applications
- Provide a web-based development environment for beginners in HPC systems and quantum computing



Facilitates the easy design and simulation of large-scale quantum circuit

Quantum Computer Simulator Web Service for Live Programming

- Qni (Web-based Quantum Circuit Simulator developed by TIS Inc.)
- Open OnDemand (Web portal)



Developed and deployed a web service on ABCI for easy quantum circuit design.

(AIST press release (Japanese only) on August 7, 2024)



ABCI-Q will be available in Q2 2025.



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