

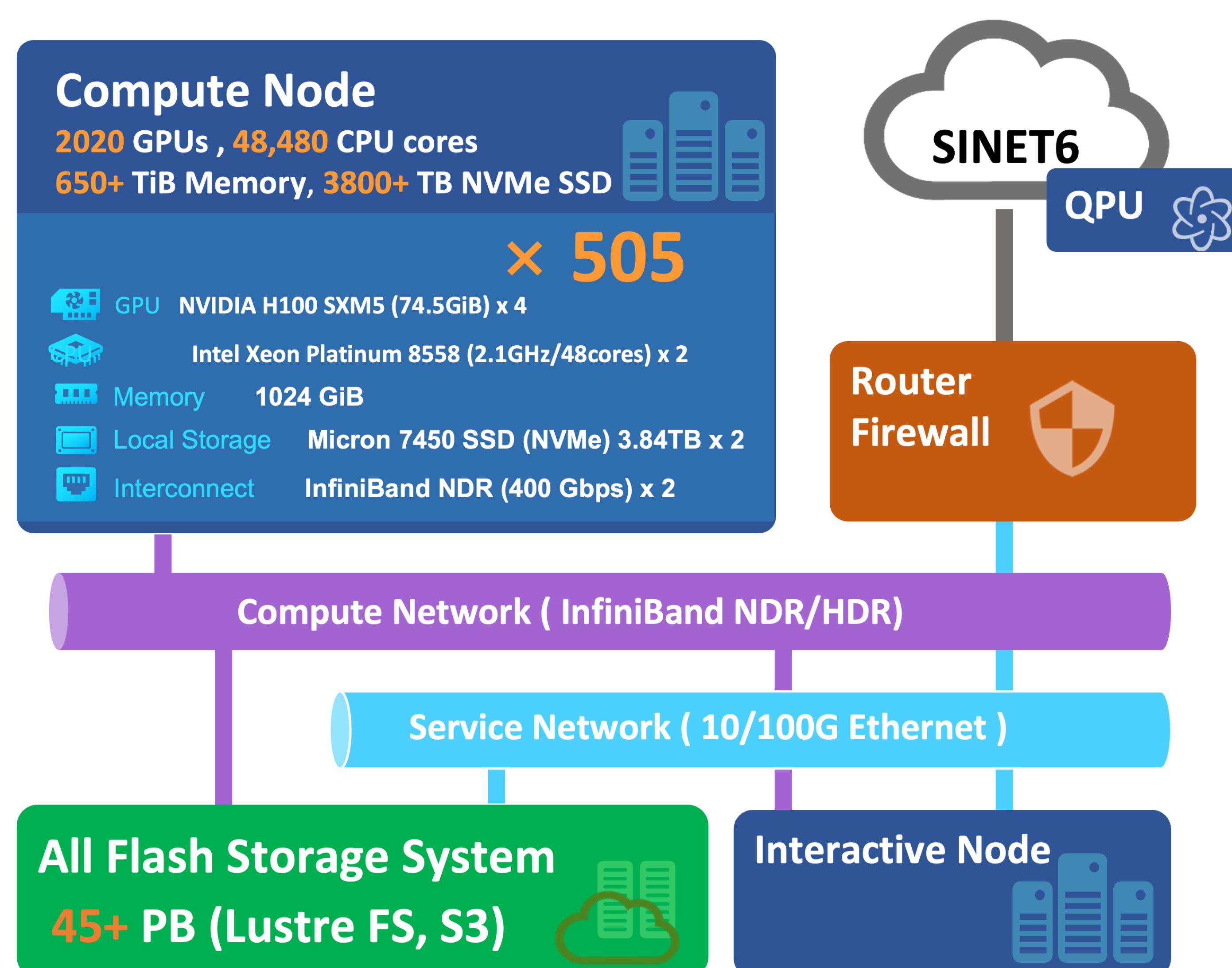
ABCI-Q

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

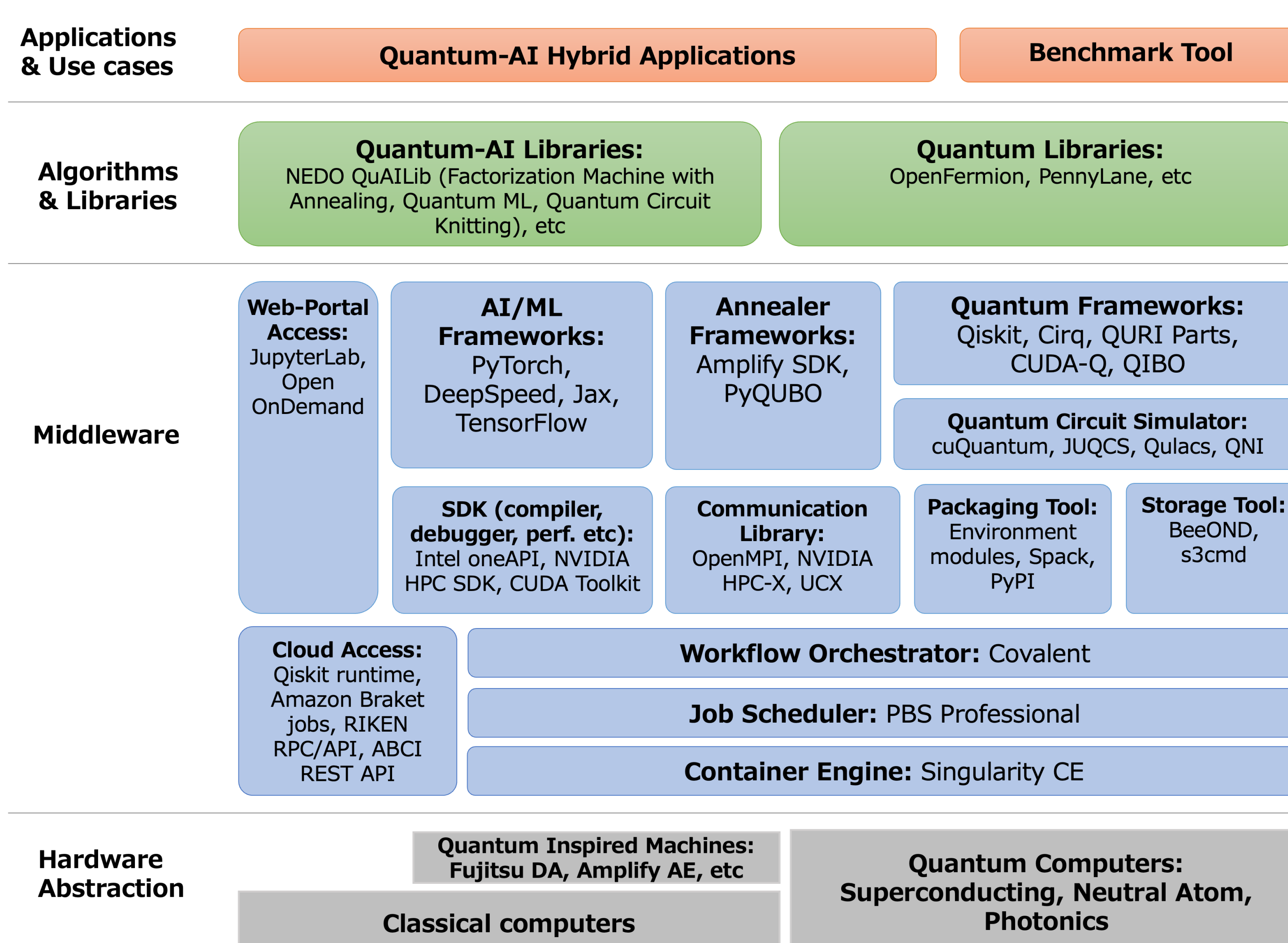
ABCI-Q Hardware

- 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



ABCI-Q will be available in early 2025



Global Research and Development Center for Business by Quantum-AI Technology (G-QuAT), AIST

Contact : M-G-QuAT-plan-ml@aist.go.jp

AIST
Create the Future, Collaborate Together

Global Research and Development Center for Business by Quantum-AI Technology