Qmio>
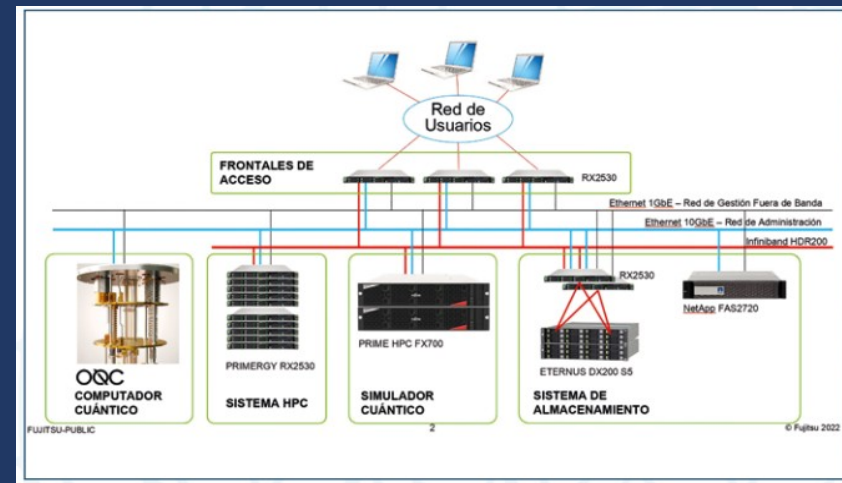
Introduction

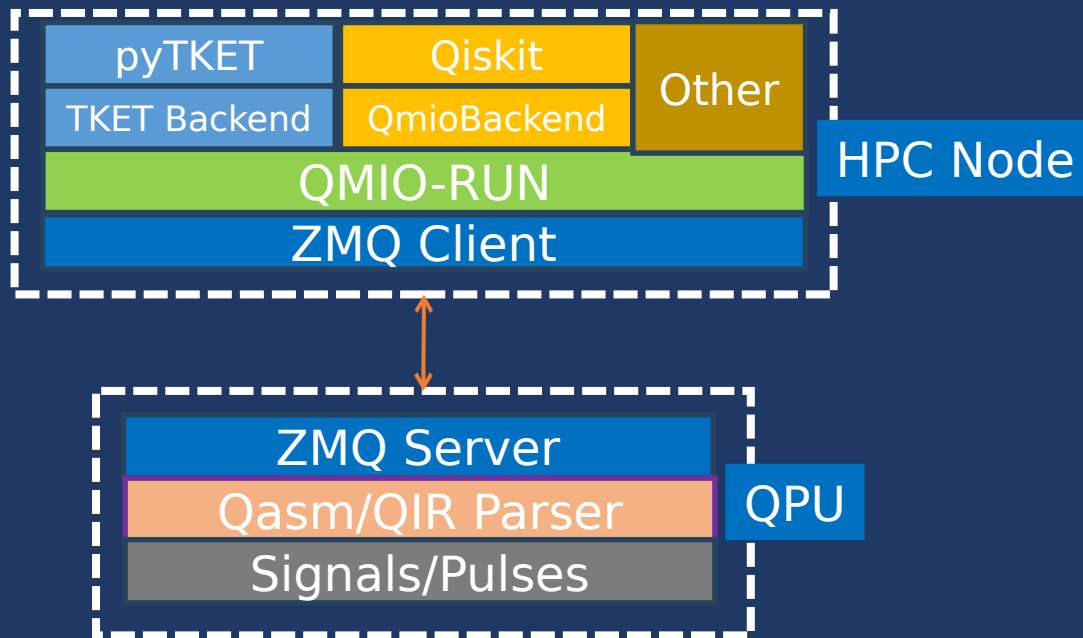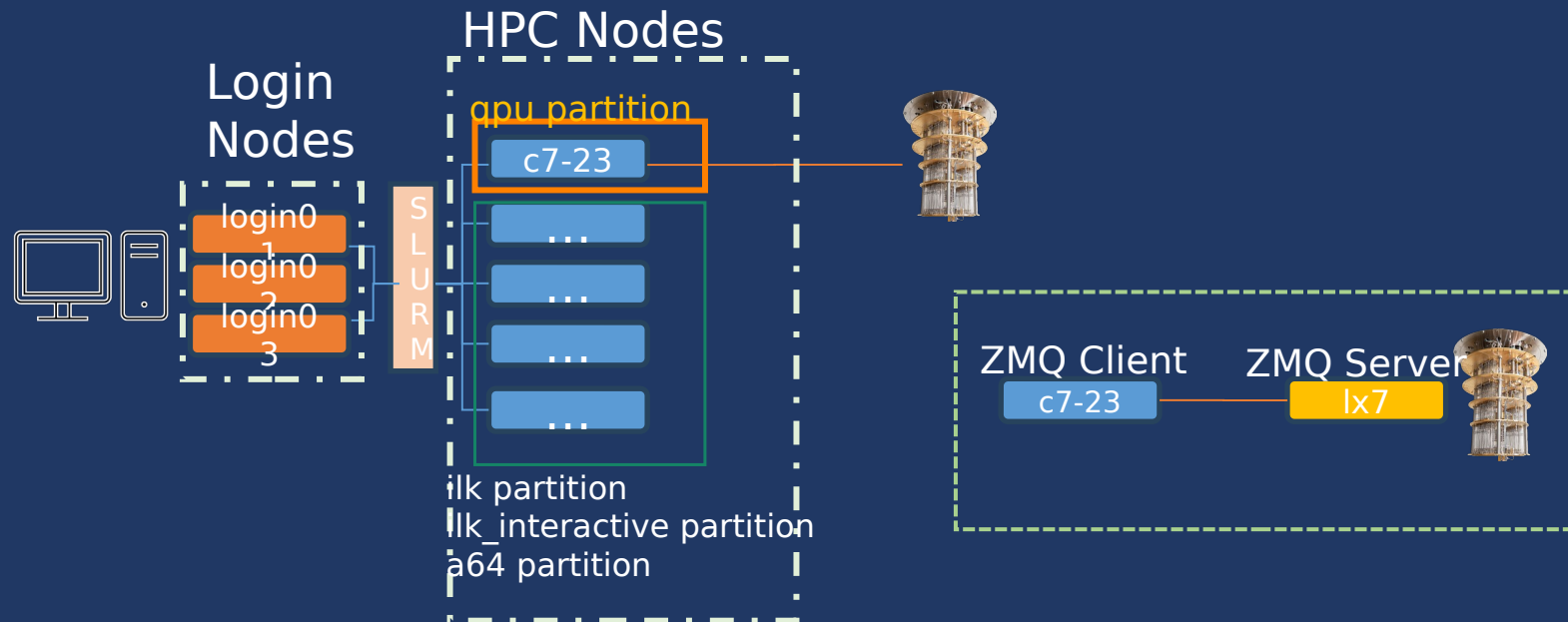# What is Qmio?

o Computing infrastructure designed to research in Quantum Computing and Quantum inpired computing

o It is composed of:
- Quantum Processing Unig (QPU)
- HPC System
- Quantum Computer Emulator
- Storage system

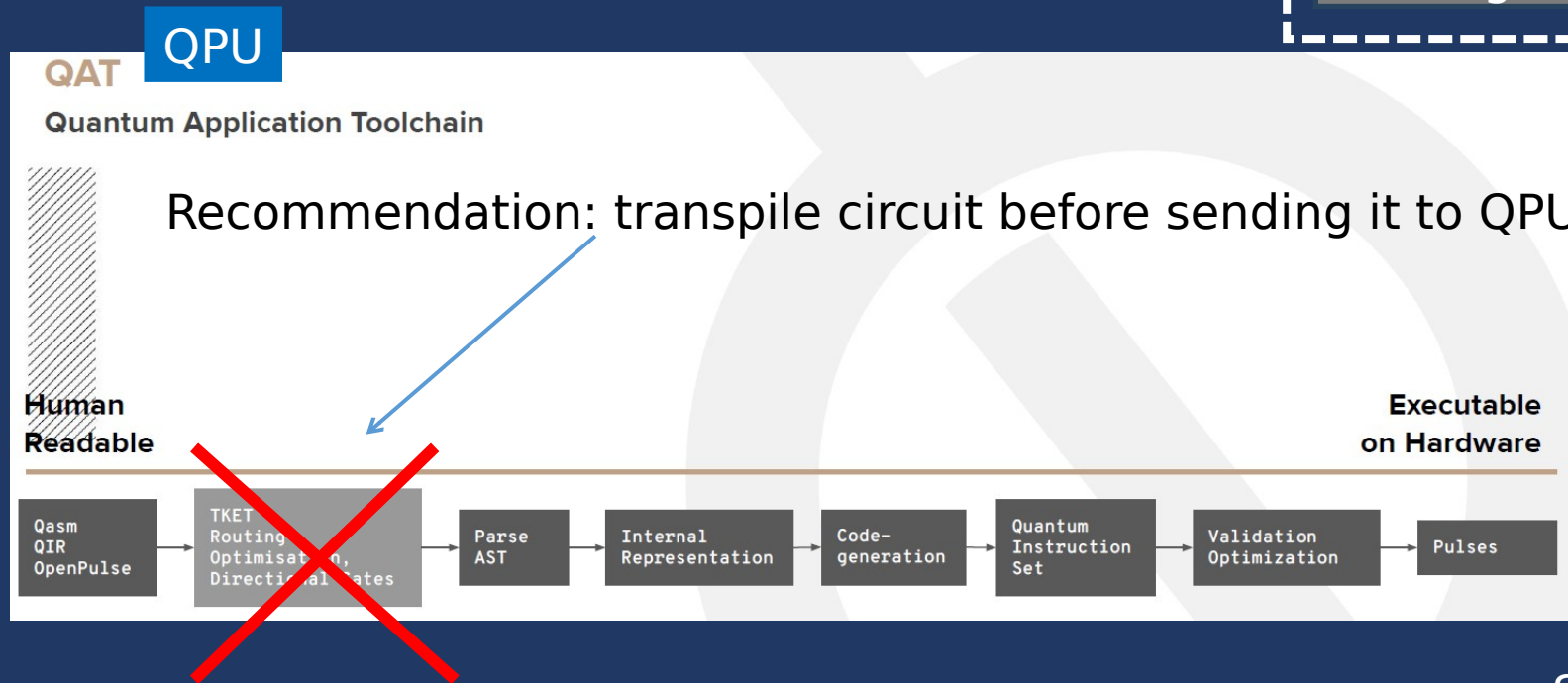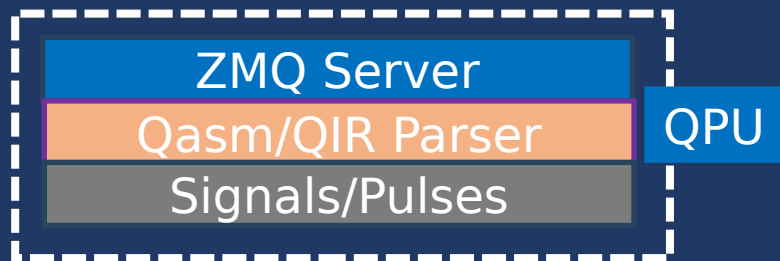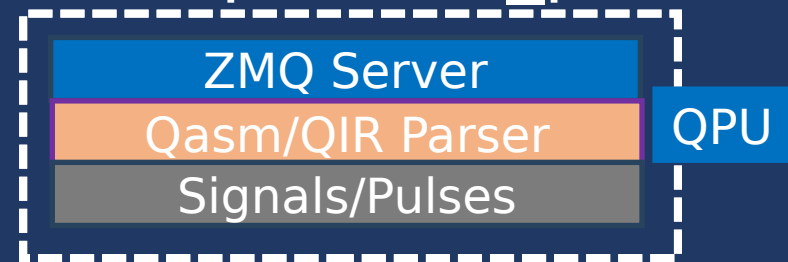o Access is granted through specific open calls

Qmio QPU Software stack

Qmio QPU Software stack- Lowest level

Qmio QPU – QPU Software stack

QPU

ZMQ Server
Qasm/QIR Parser
Signals/Pulses

QPU

QAT

Quantum Application Toolchain

Recommendation: transpile circuit before sending it to QPU

Human Readable

Executable on Hardware

| Qasm QIR OpenPulse | TKET Routing Optimisation, Directional Gates | Parse AST | Internal Representation | Code-generation | Quantum Instruction Set | Validation Optimization | Pulses |

Source: OQC

Qmio QPU – Software stack- Repetition_period

Repetition Period

Execution time

ZMQ Server

Qasm/QIR Parser

Signals/Pulses

QPU
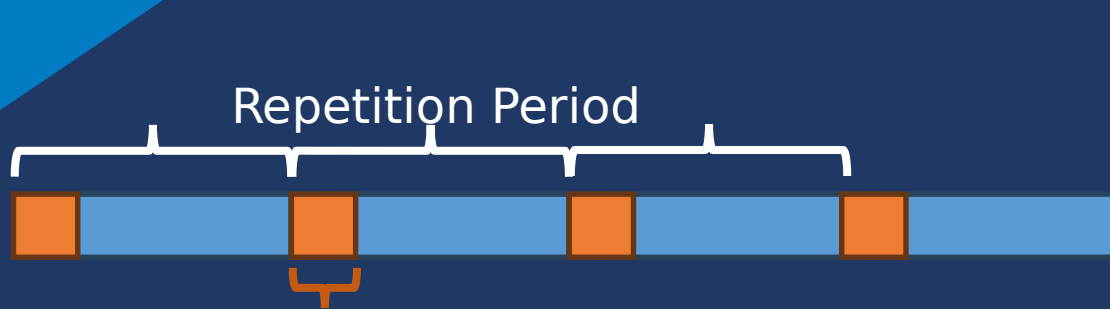
How to use it:

service = QmioRuntimeService()
with service.backend(name="qpu") as backend:
    results = backend.run(input, shots, **repetition_period**, res_format)

It is useful because there is no active initialization (not yet): good value ~5xT1

Qmio QPU Topology