

SimulaQron

A simulator for developing quantum internet software

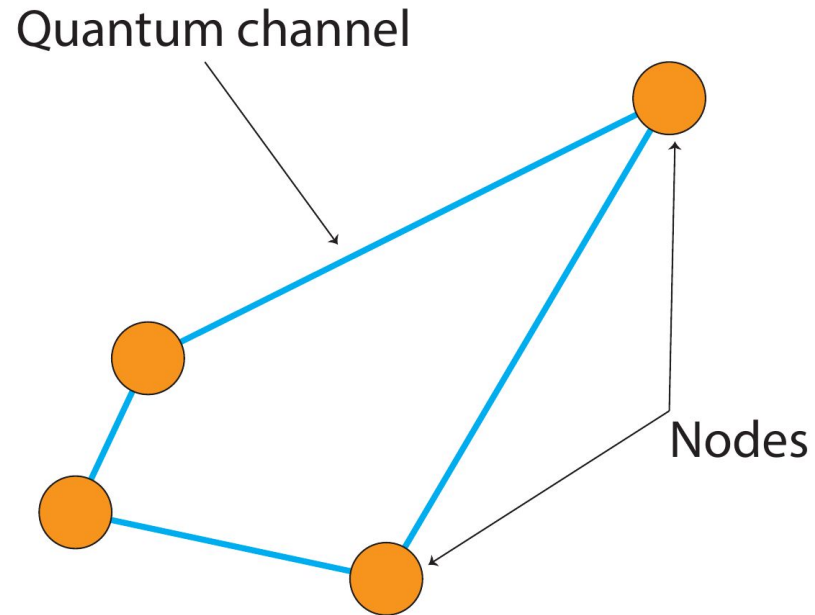
arXiv: 1712.08032

www.simulaqron.org

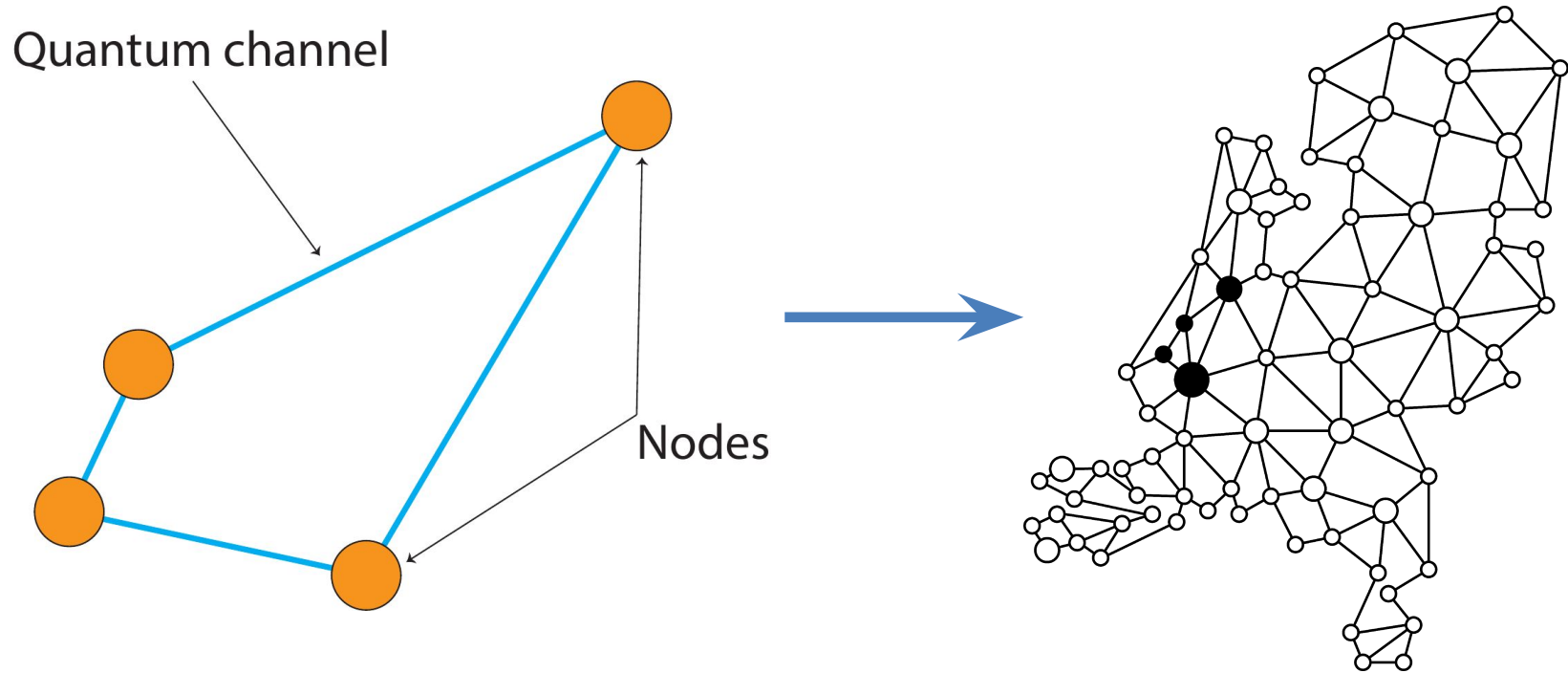


Axel Dahlberg
Stephanie Wehner

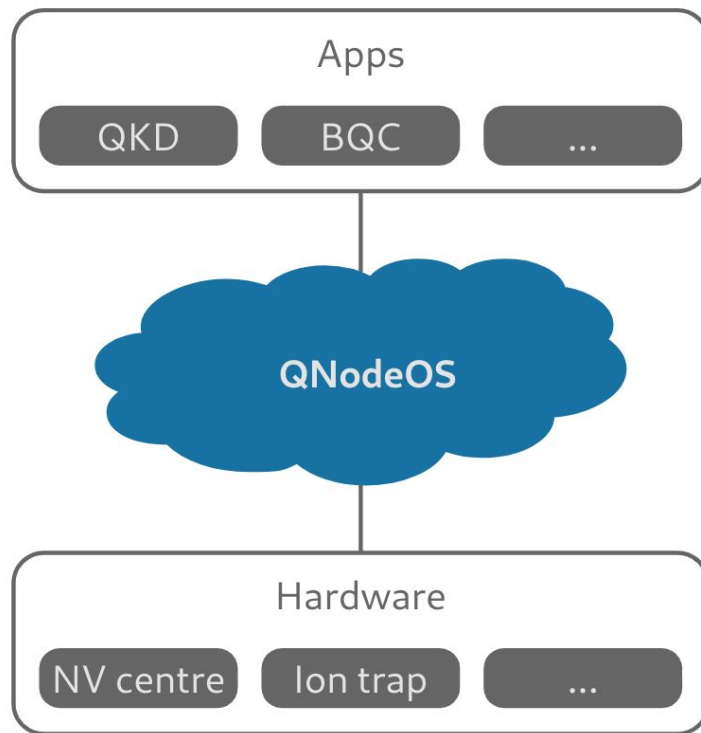
Quantum Network



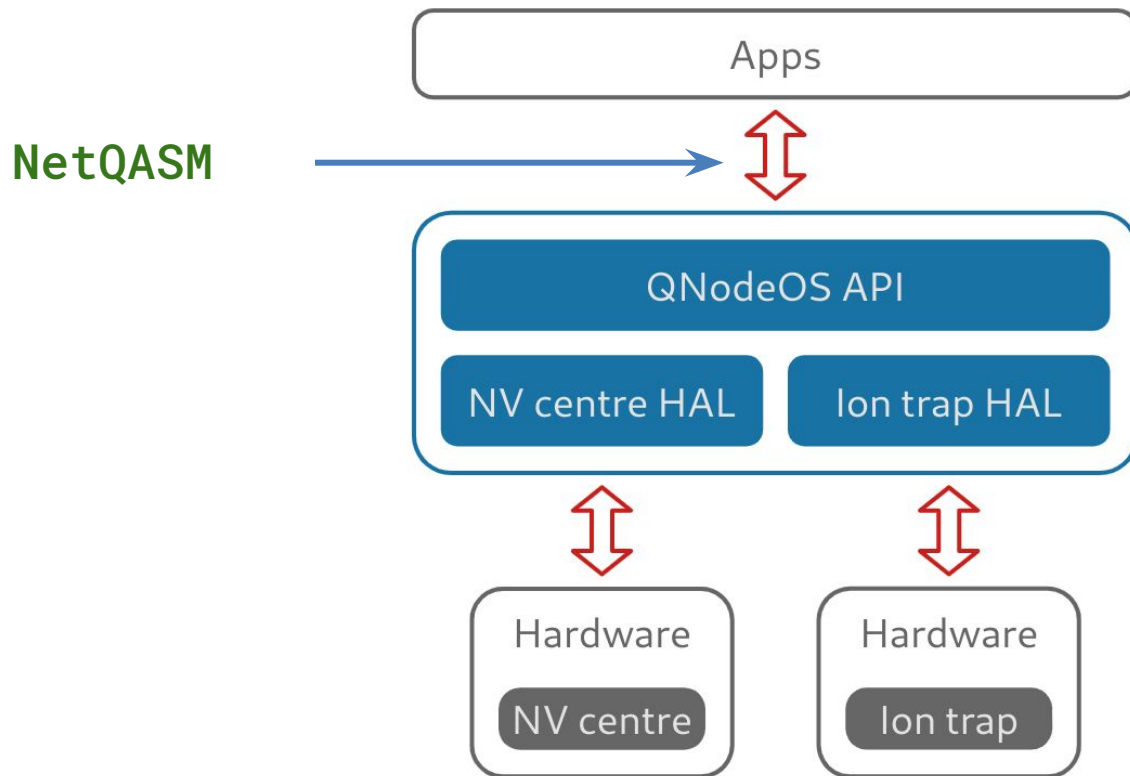
Towards a Quantum Internet



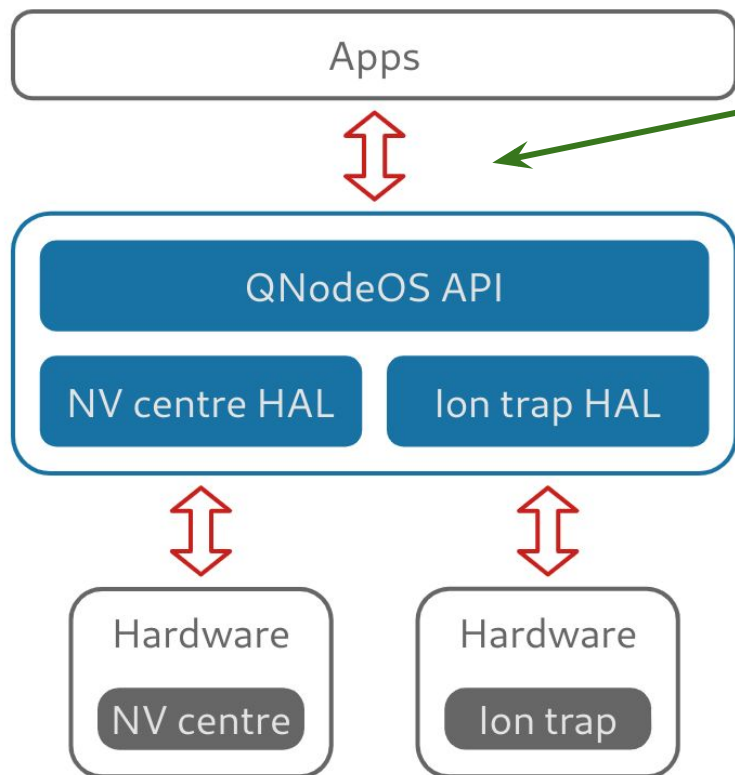
Need for QNodeOS



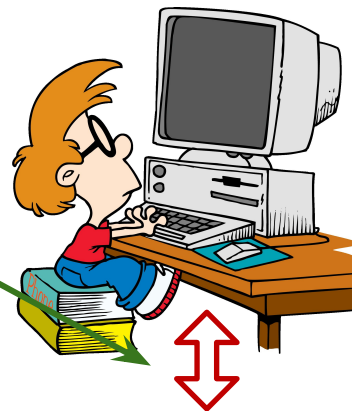
Need for QNodeOS



Need for QNodeOS



NetQASM



NetQASM

a low-level instruction set architecture
for quantum internet applications

WIP

```
# NETQASM 0.0
# APPID 0
# DEFINE ms @0
// Setup classical registers
set Q0 0
array(10) ms!
set R0 0

// Loop entry
LOOP:
beq R0 10 EXIT

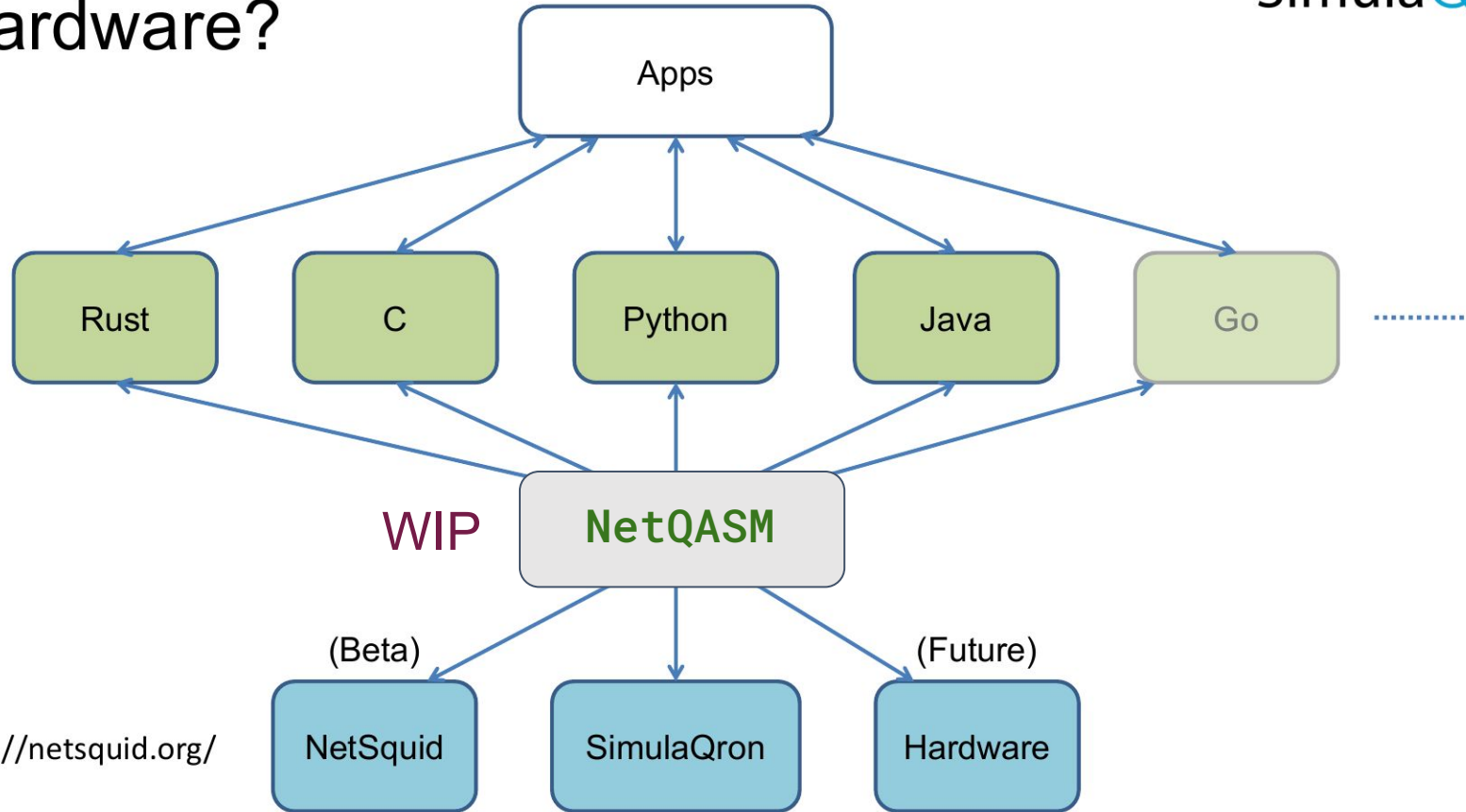
// Loop body
qalloc Q0
init Q0
h Q0
meas Q0 M0

// Store to array
store M0 ms![R0]

qfree Q0
add R0 R0 1

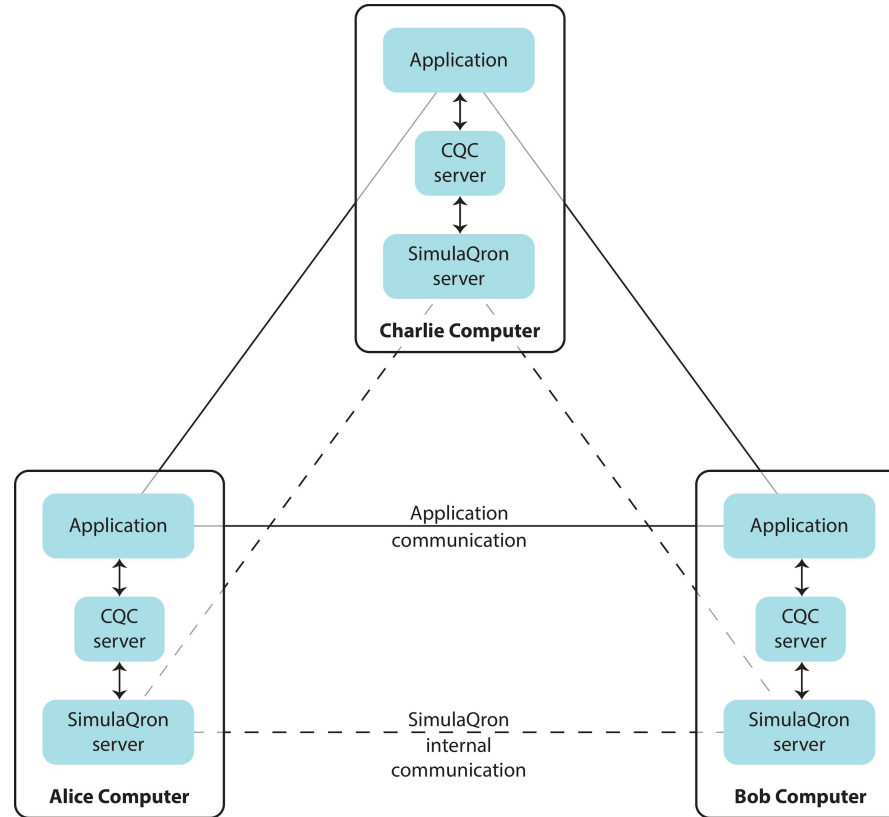
// Loop exit
beq 0 0 LOOP
EXIT:
```

No hardware?

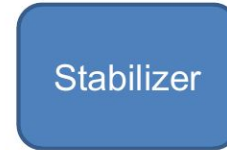
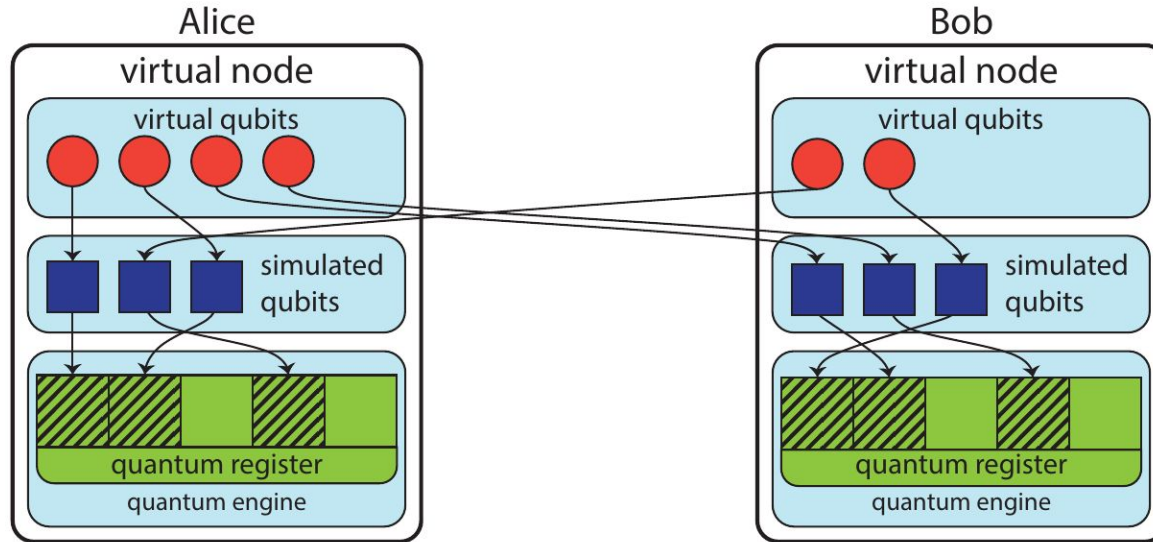


<https://netsquid.org/>

Distributed simulation



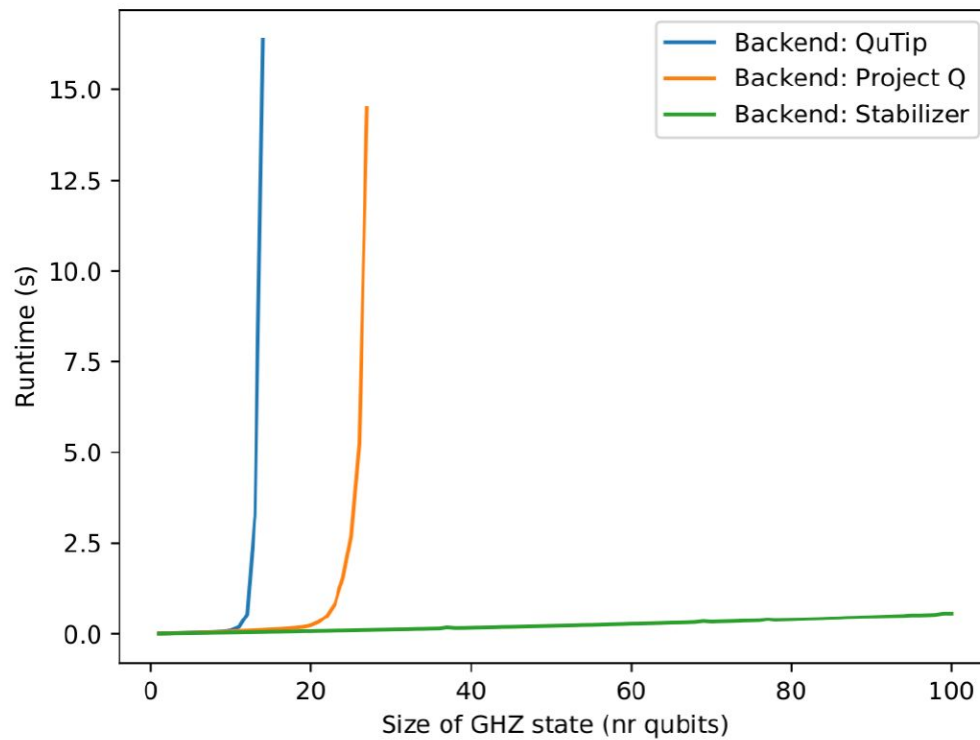
Nodes in SimulaQron



Density matrices

Vectors

Stabilizer formalism



Easy to get started

A terminal window with a dark purple background and blue text. On the left, there is a blue vertical bar with two white tilde (~) characters. To the right of the bar, the commands are displayed in two lines.

```
~ pip3 install simulaqron  
~ simulaqron start
```

www.simulaqron.org