Nu Quantum's Entanglement Fabric™

Trailblazers of quantum datacentre scale-out

Dr Mario de Miguel Ramos
Managing Director, Nu Quantum España

Géant SIG-Quantum Meeting - Geneve - 30 June 2026

Started 2026 strong - powered by our exceptional team

$60M

December 2025
Largest funding round for a pure-play networking company

Nu Quantum launches Ion Networking Lab in Cambridge

Founders of the Quantum Datacenter Alliance

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Spin out from UNIVERSITY OF CAMBRIDGE

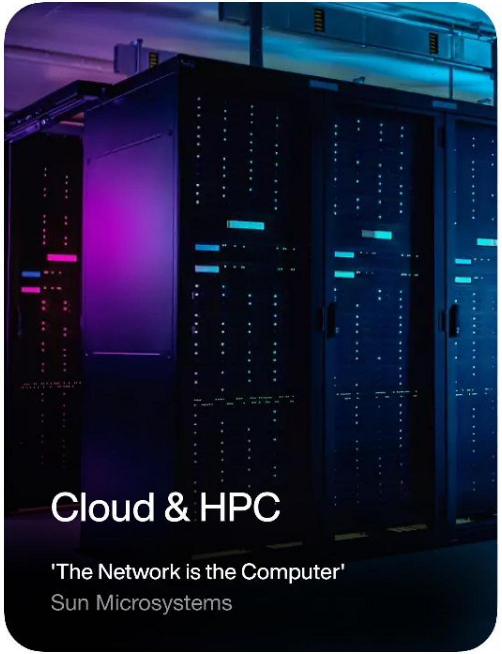
Offices: Cam | LA | Spain

Stats

People	Female	Nationalities	LGBTQ	PhDs	Tech disciplines
80 FTE	40%	20	10%	28	9

Trillion dollar computing industries exist thanks to scale-out

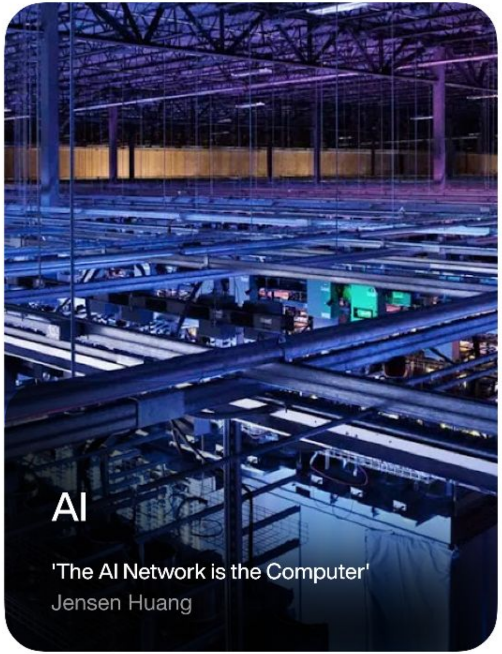
Networking technology aggregating the power of thousands of CPUs, GPUs, and now, QPUs



Cloud & HPC

'The Network is the Computer'
Sun Microsystems

$3T projected by 2033
McKinsey



AI

'The AI Network is the Computer'
Jensen Huang

$4.8T projected by 2033
UN Trade & Development

Nu Quantum's networking technology for Scale Out

- → Essential
- → Timely
- → Unique
- → Defensible

Quantum

Nu Quantum is positioned to enable this essential piece of the stack

$1.3T projected by 2035
McKinsey

Quantum scale-out is essential to unlock commercial value

Why does it feel like quantum turned a corner in 2025 and into 2026?

- Requirements of quantum algorithms improved by x20
- Overheads of quantum error correction improved by x10-20
- Physical qubit quality improved by x10
- Logical qubits demonstrated

Enter the Logical Era

2025

1 - 10 Logical Qubits
10^{-3} Logical Error Rates

Narrow Scientific Quantum Advantage

2027

100 Logical Qubits
10^{-6} Logical Error Rates
'MegaQuop'

First Commercial Quantum Advantage

2030

1,000 Logical Qubits
10^{-6} Logical Error Rates
'GigaQuop'

RSA-Breaking Machine

2033

6,000 Logical Qubits
10^{-12} Logical Error Rates
'TeraQuop'

Unlock 1 Trillion Dollar Value

2035

10,000+ Logical Qubits
10^{-14} Logical Error Rates

Single QPU scaling

Limited to ~100s logical qubits by interdependent fundamental challenges

Scalability gap to commercial value

Power of many QPUs

A solution to this problem will deliver outsized returns

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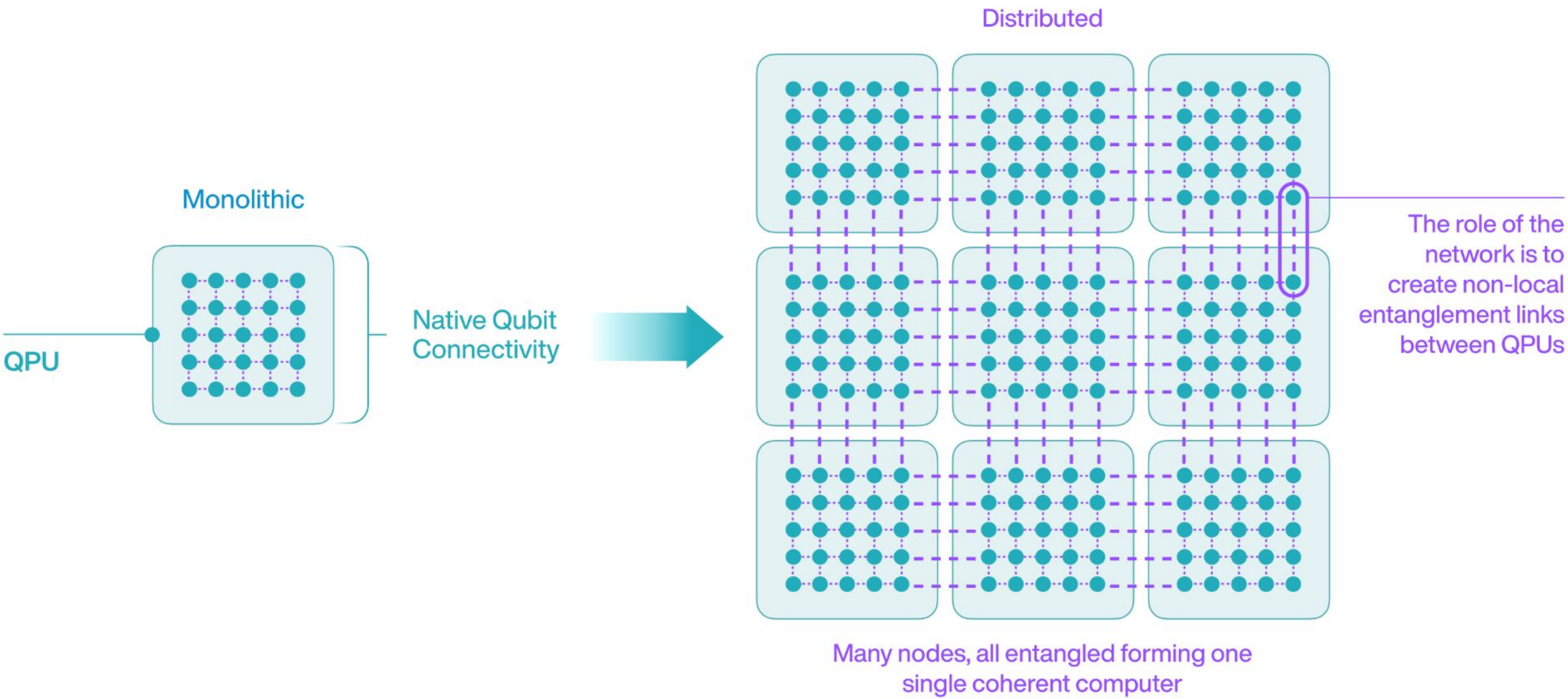
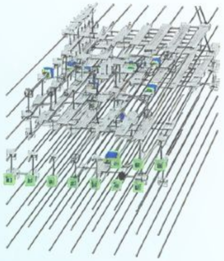
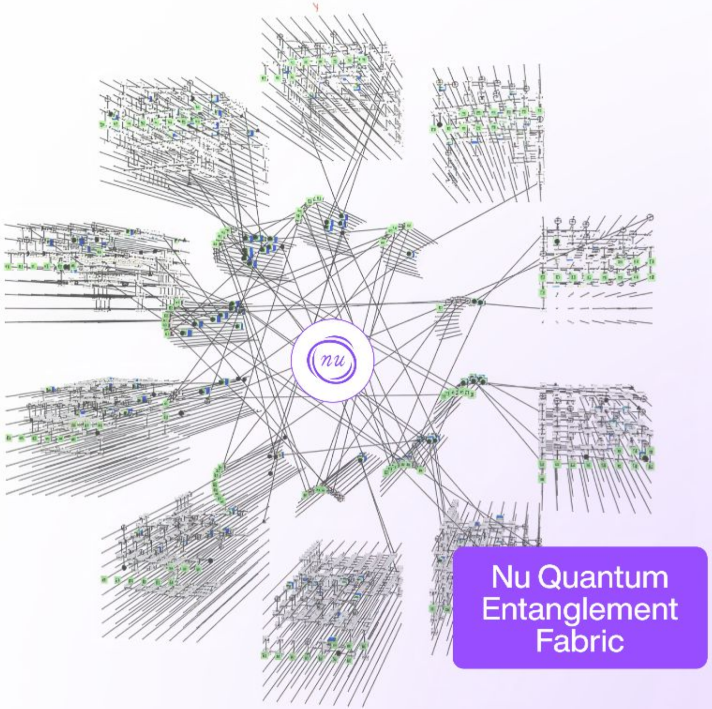
What does Scale-out or Distributed Computing mean for Quantum?



Quantum scale-out: a formidable challenge in urgent need of a solution



Scalability gap
to commercial value



Single QPU scaling

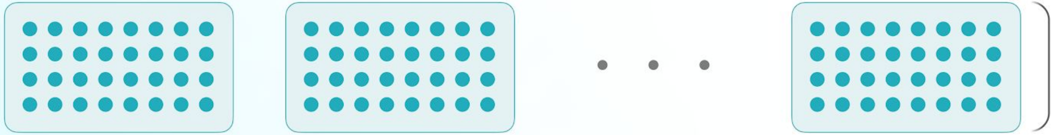
Like CPUs and GPUs, **single-QPU scaling is limited** by fabrication yields, chip size, control, temperature, power, and calibration cycles.

Power of many QPUs: The Entanglement Fabric

Nu Quantum's breakthrough architecture for fault-tolerant scale-out is underpinned by networking hardware systems delivering 100x performance improvements over the state-of-the-art.

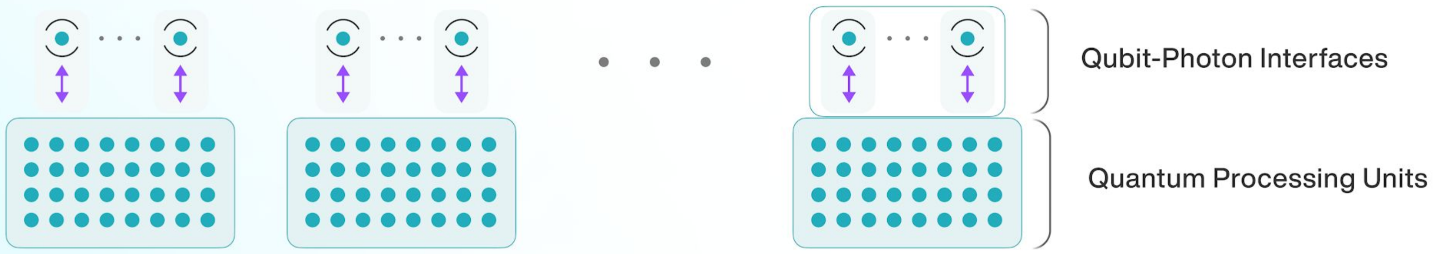
Modular | Error-Corrected | Efficient

Distributed Quantum Computing

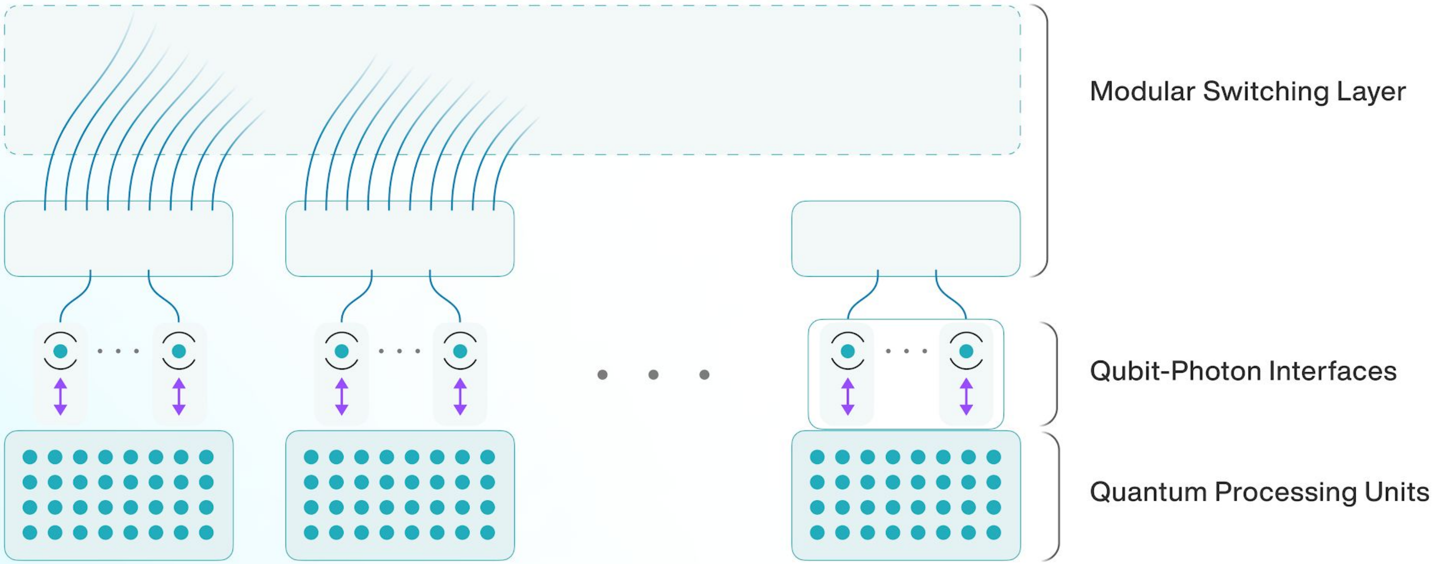


Quantum Processing Units

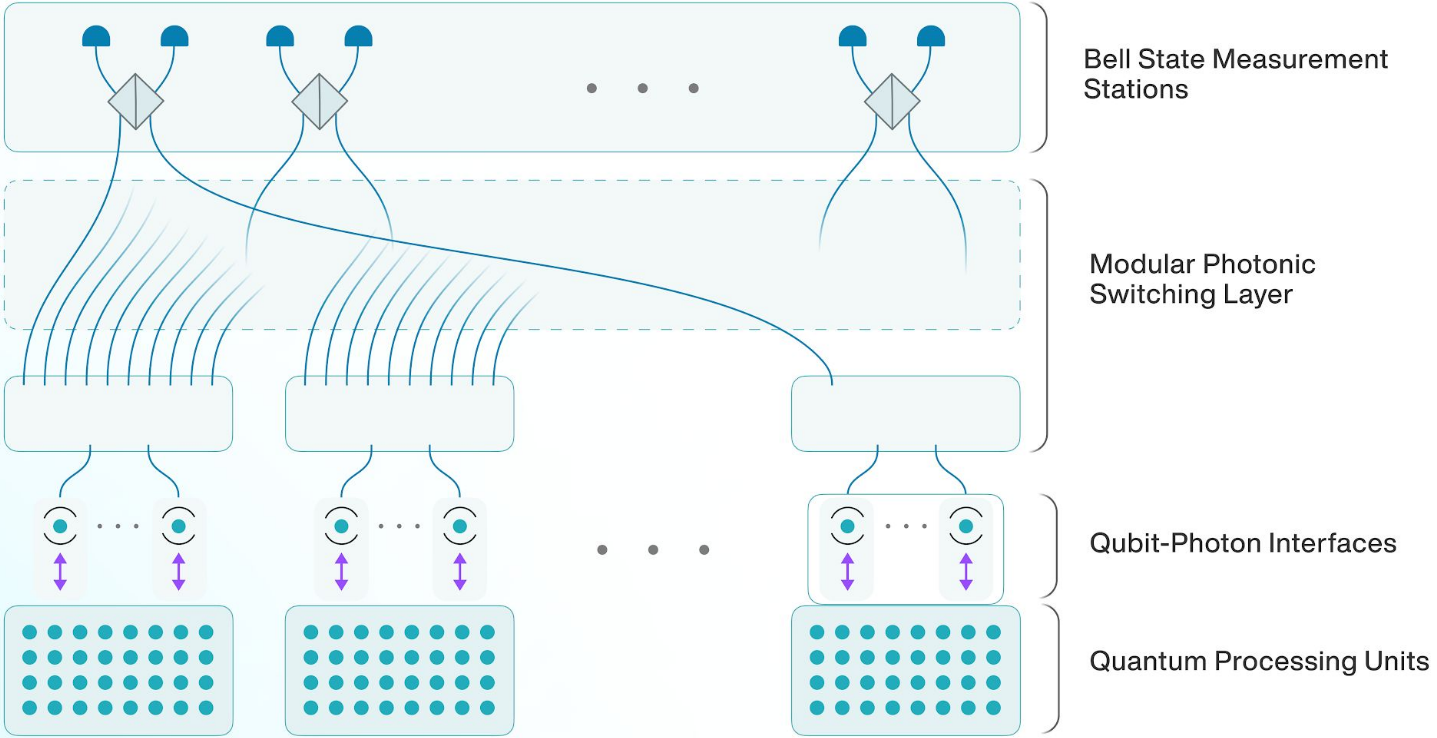
Distributed Quantum Computing



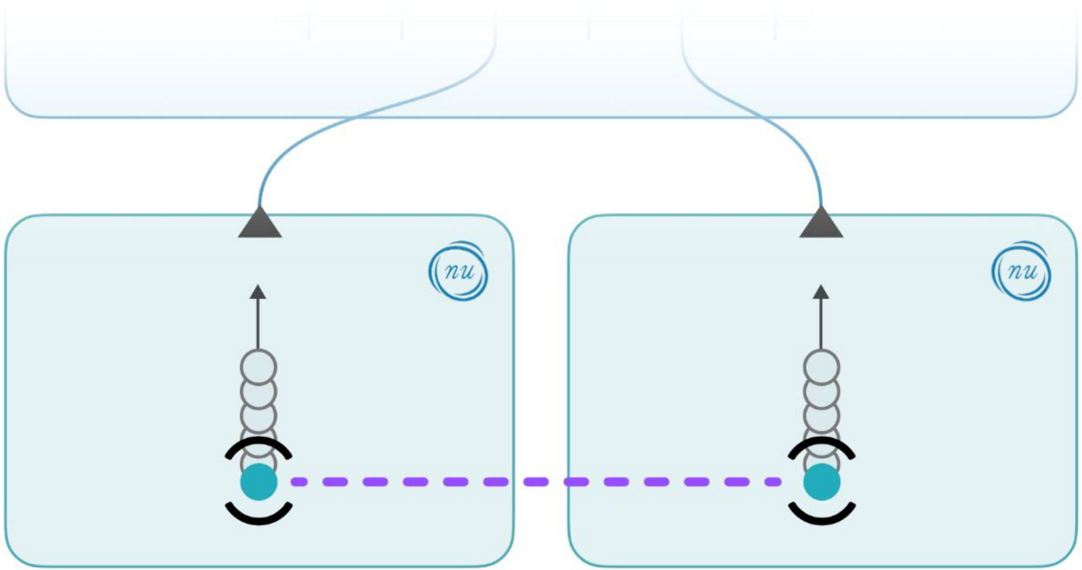
Distributed Quantum Computing



Distributed Quantum Computing



End Result: entanglement between two QPUs



Entanglement
between two QPUs

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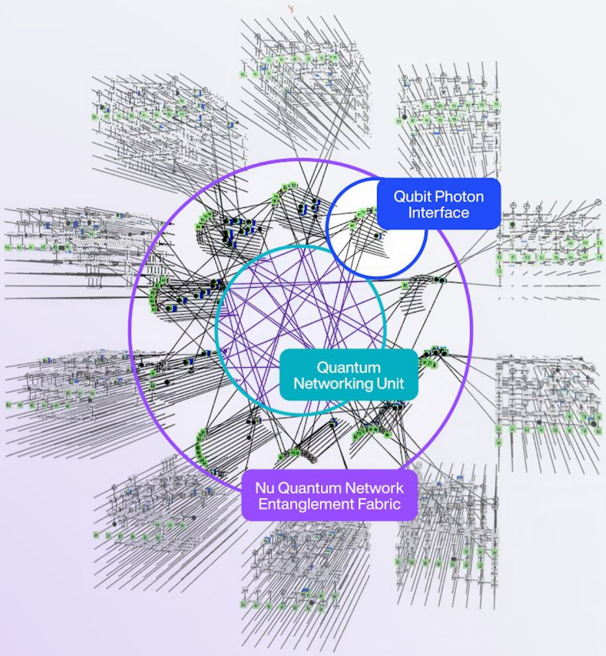
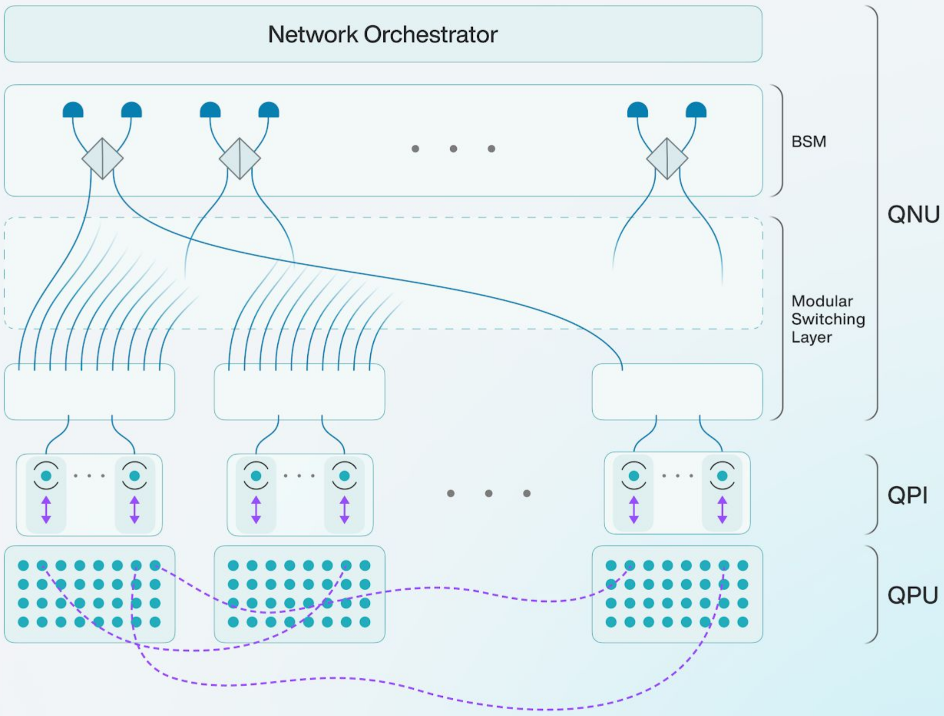
Distributed Architecture

Non-local connectivity supporting efficient QEC codes



Nu Quantum Network Hardware Stack

Non-local connectivity supporting efficient QEC codes



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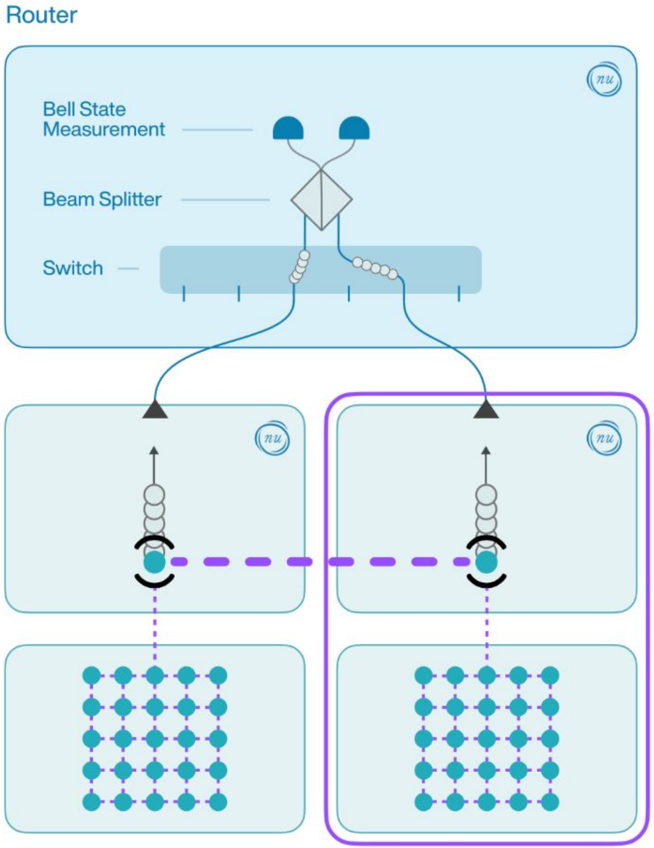
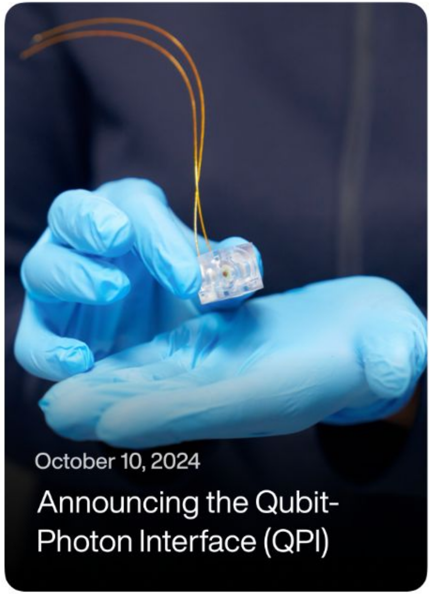
The world's first quantum NIC - our Gen1 QPI Systems





QPI for neutral atoms

In collaboration with Infleqtion

Infleqtion

QPI for trapped ions

In collaboration with NQCC

UKRI National Quantum Computing Centre

Industrialising qubit-photon interface technology

Building on Nu Quantum's in-house expertise on QPI fabrication and design

100s μm²
Mirror diameter

< 0.3 nm *rms*
Mirror surface roughness

1 MHz- 6 GHz
Cavity locking resonance tunability

< 20 pm
Cavity length locking precision

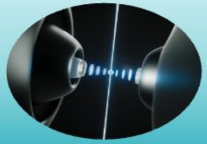
Delivering a first-of-its-kind ion trap with an integrated QPI

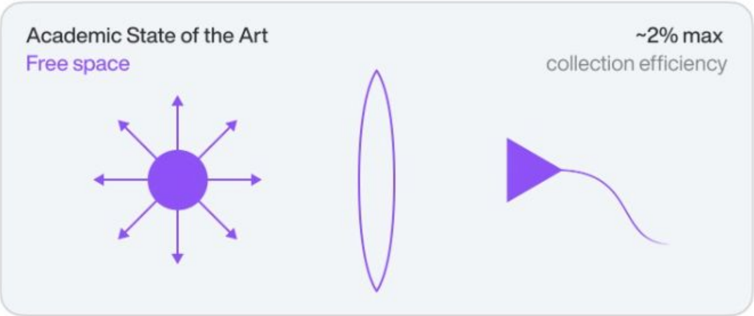
Concept ideation & early-stage tests for wafer-based Gen2 QPI

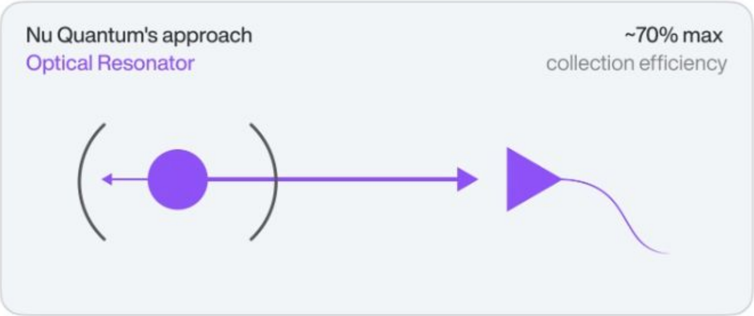
Interfacing our QPI with Trapped ions

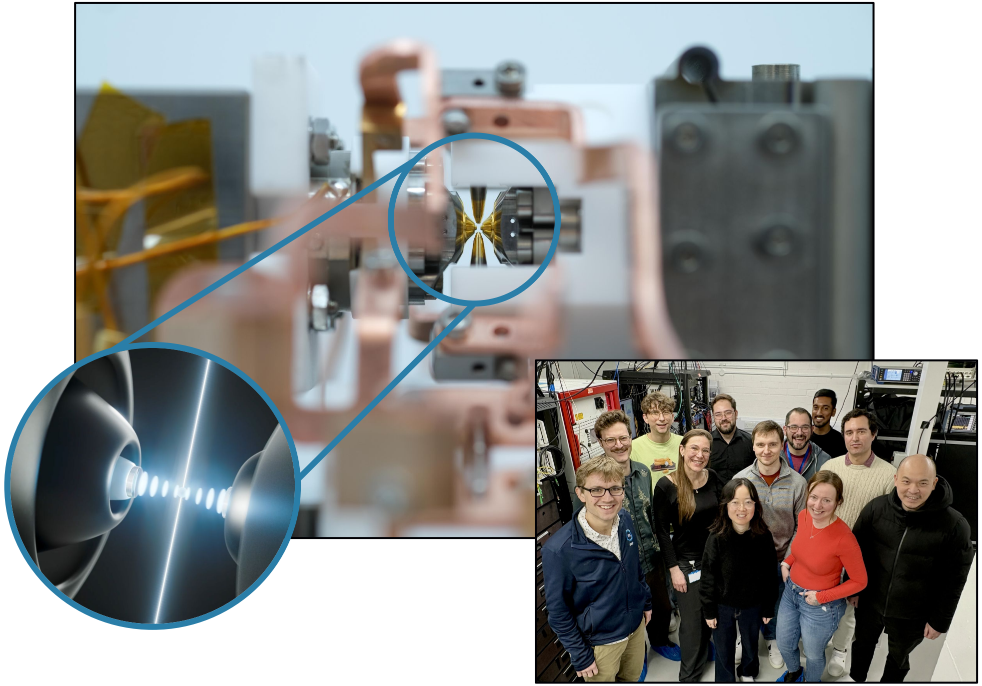
Qubit Photon Interface

extracts light from qubits using optical microcavity technology









Our trapped ion qubit networking lab

Quantum Networking Unit

Datacenter-scale entanglement distribution

→ Modular

→ Performant

→ Upgradable

→ Qubit Adaptable

Gen 1 [2025]

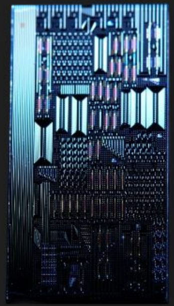
Supports up to

99.7% Entanglement fidelity

MHz Entanglement attempt rate

300 ns Control system latency

Gen 2 [2027]



Proprietary switching technology

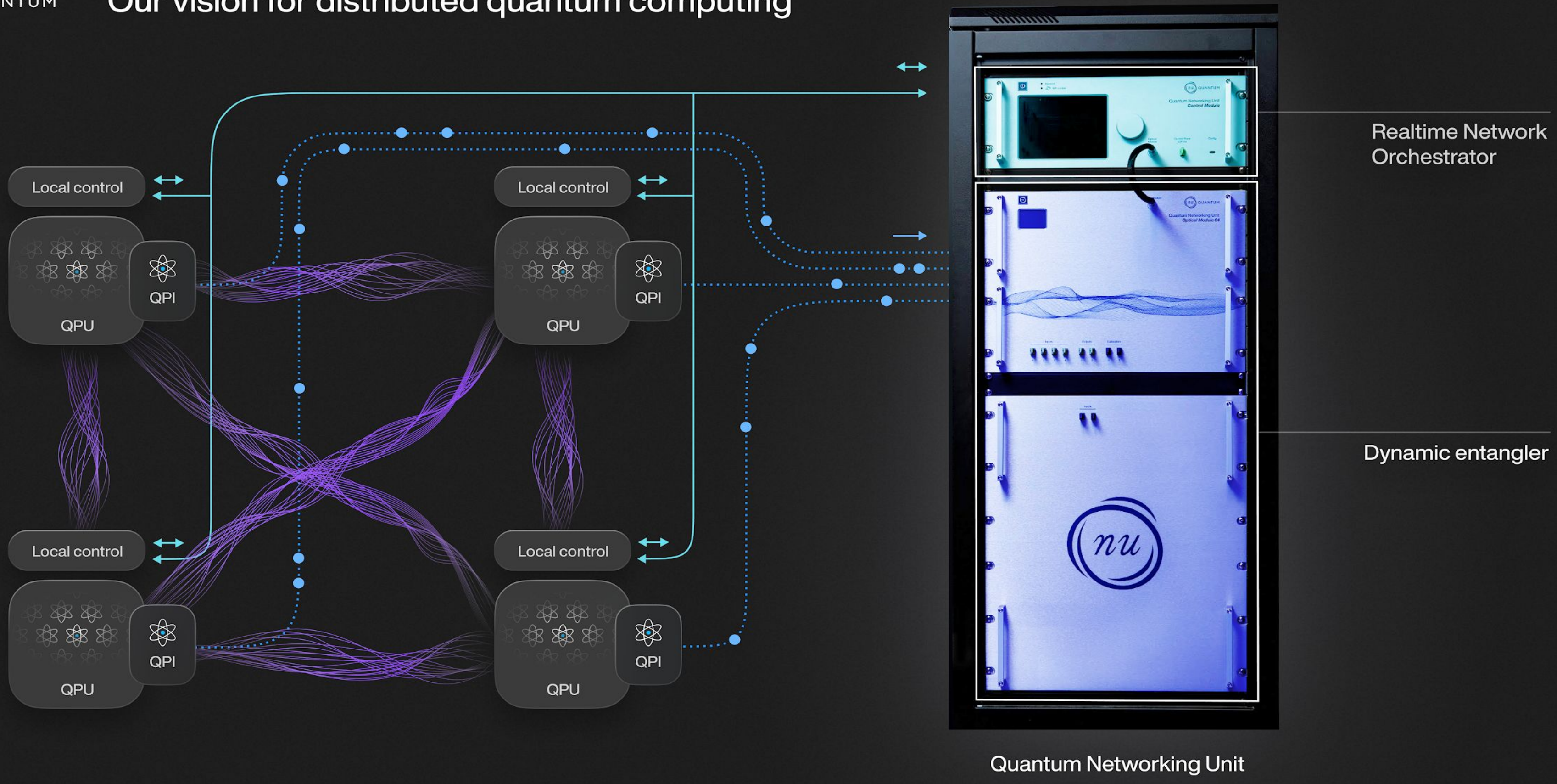
→ Lower loss

→ Higher speed

→ Higher fidelity

→ Higher node count

Our vision for distributed quantum computing



QPI:
Qubit-Photon Interface

Ultra-low latency classical channel

High fidelity quantum photonic channel (optical fibre)

On demand entanglement resource generation

Logical Architectures

Efficient, Error Corrected Scale-out

Network delivers:

→ Non-local connectivity

→ Reconfigurability

Therefore Enables:

→ Efficient, high-rate codes

→ Modularity

→ Resilience

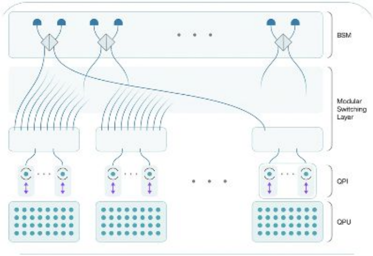
→ Elasticity

Distributed Quantum Error Correction based on Hyperbolic Floquet Codes

2025 IEEE International Conference on Quantum Computing and Engineering (QCE)

Authors: Evan Sutcliffe, Bhargavi Jonnadula, Claire Le Gall, Alexandra E. Moylett, Coral M. Westoby

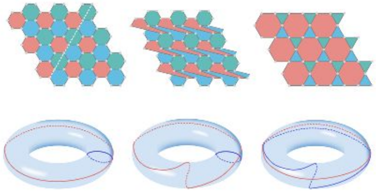
→ January 2025



Logical Gates on Floquet Codes via Folds and Twists

Authors: Alexandra E. Moylett, Bhargavi Jonnadula

→ December 2025

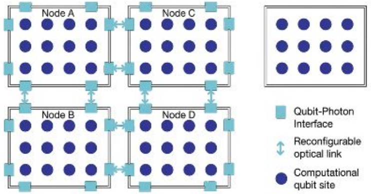


New results!

Tolerating Device Failure in Distributed Quantum Computing

Authors: Evan Sutcliffe, Coral M. Westoby

→ May 2026



New Results

Tolerating Device Failure in Distributed Quantum Computing

arxiv, Sutcliffe & Westoby, 2026

→ Resilience

→ Elasticity

Towards mature quantum computing business services

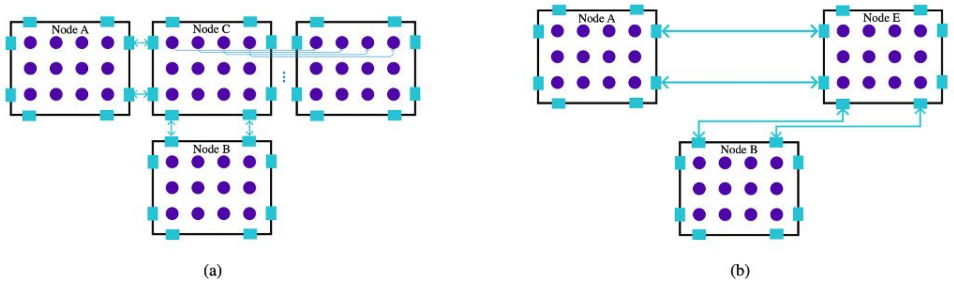


Figure 2: Schematic showing how a node (e.g. a QPU) can be swapped out of a quantum network while maintaining a QEC code. (a) For swap-out, data qubits held on Node **C** are each teleported out onto the unused node, Node **E**, using shared Bell states. Then, as shown in (b), the network is reconfigured such that Node **E** has required connectivity to replace Node **C** in the distributed QEC code.

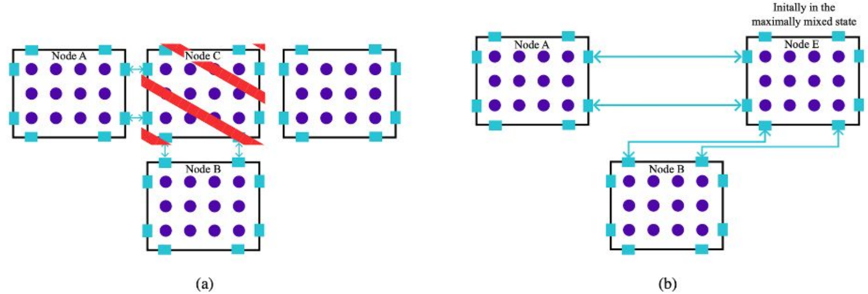


Figure 3: The process of node swap-out when node failure is unscheduled. (a) A catastrophic failure occurring on Node **C**. As such, the state of the qubits held at **C** are corrupted and discarded. Then, as shown in (b), the same number of (data) qubits at Node **E** are initialised in the maximally mixed state, and Node **E** is interconnected in place of **C**.

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Building the commercial ecosystem for quantum scale-out

Quantum Datacenter Alliance

A forum on building datacenter-scale quantum computers and accelerating the timeline to fault-tolerance.

Launched by Nu Quantum in 2024

Website qda.global

Founding companies

CISCO · NTT DATA · nu QUANTUM · OQC · QPHOX · QUANTINUUM · QuEra Computing Inc.

Next event: 1st October 2026!

The QDA Inaugural Forum - 26th June 2025, London

Sold Out | 100+ Attendees | Listed as official event IYOQ by UNESCO

CISCO · NTT DATA · nu QUANTUM · OQC · QPHOX · QUANTINUUM · QuEra Computing Inc. · Riverlane · CERN · Google · IBM · Infineon · NanoQT · UK National Quantum Computing Centre · photonic · PsiQuantum

We’re hiring!

Thank you!

For questions about the Spanish subsidiary, please contact
Dr Mario de Miguel Ramos
mario@nu-quantum.com

nu QUANTUM

Reach out to us
carmen@nu-quantum.com

Web
www.nu-quantum.com

Founder & CEO
Dr. Carmen Palacios-Berraquero