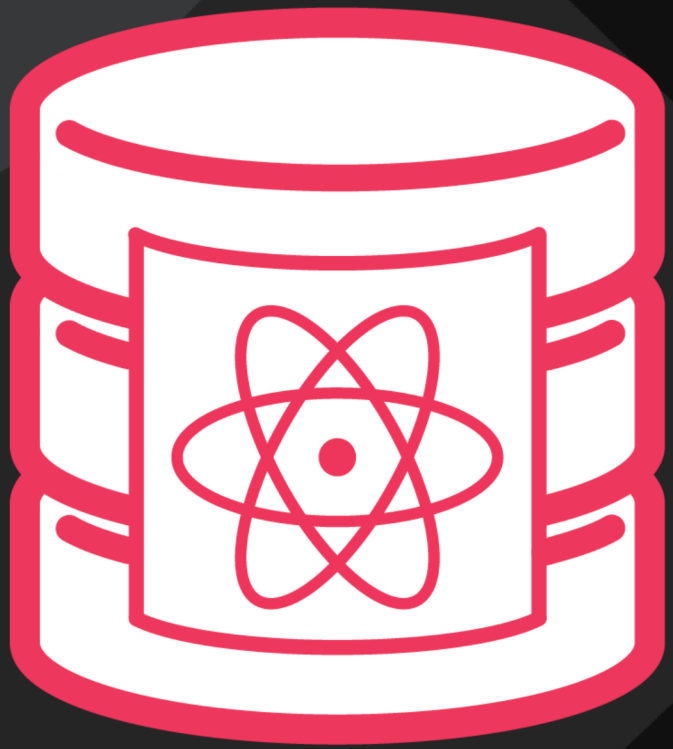
Quantum memories play an important role in entanglement-based Advanced Secure Networks.



- Store qubits
- Enable longer distance entanglement-based communication
- Aid the security of some key exchange protocols
- Essential to information processing
- Store, manipulate, & modify qubit states

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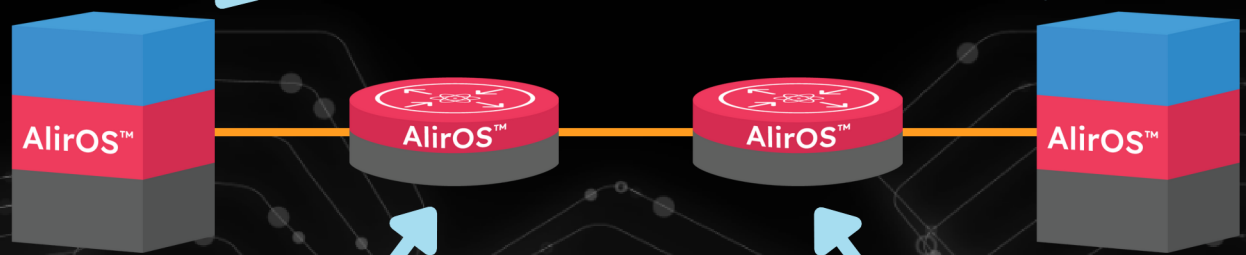
How are quantum memories used in entanglement networks?

Network Node Support

Enable Entanglement at End Points

Sharing Keys/Secrets



Communication Protocol Support

Extend Range Via Quantum Repeaters

Application Support

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A look inside:
Quantum Repeaters

Today, individual discrete components are brought together to perform the tasks of a quantum repeater.

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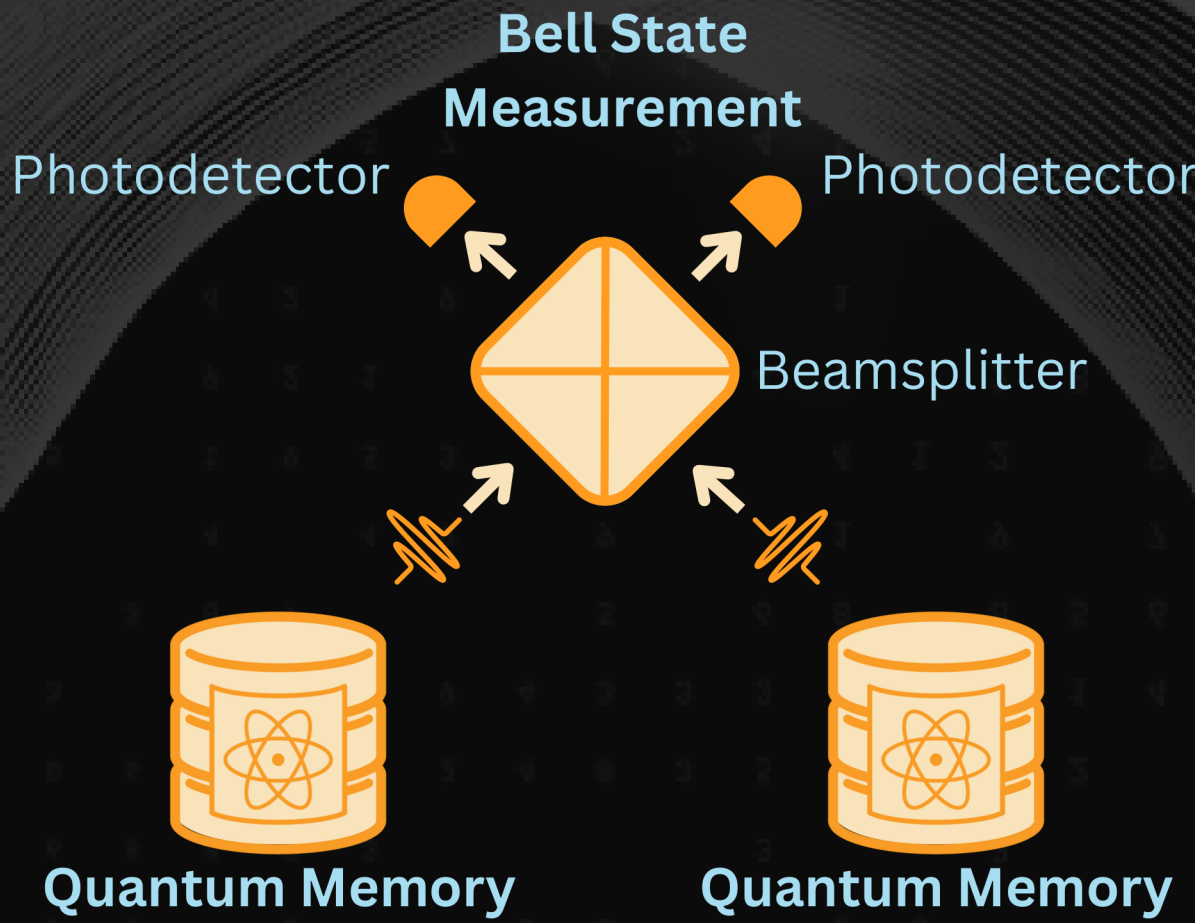
Quantum Repeaters: Internal Design



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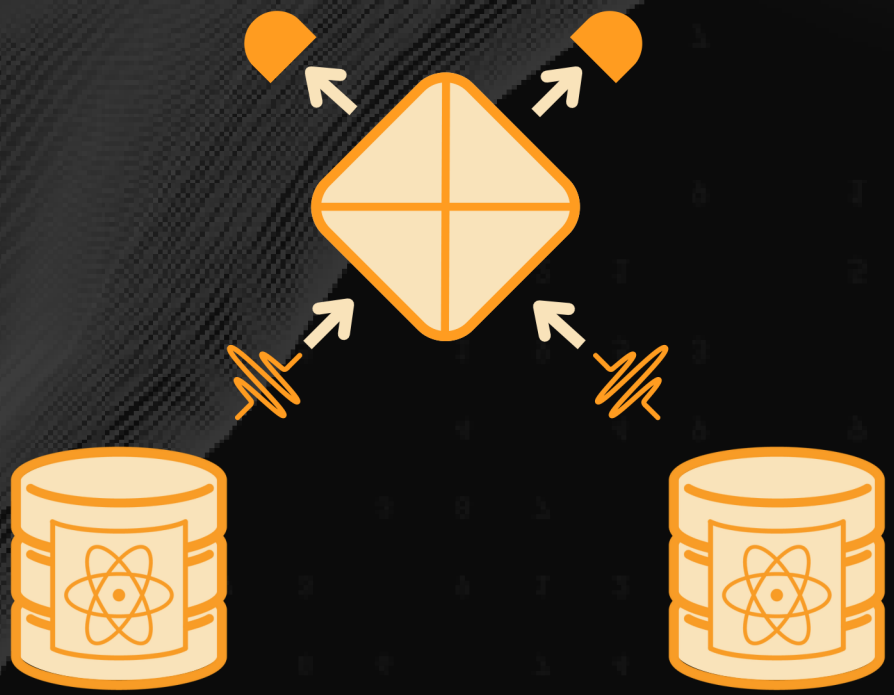
Quantum Repeaters: Internal Design



Entanglement Source
generates entangled particles that are distributed to the connected endpoints

Photon Sources and Detectors
generate and receive photons

Quantum Memories
store qubits and enable better photon indistinguishability (better fidelity) and better synchronization (incoming photons are buffered and do not have to arrive at the exact same time)

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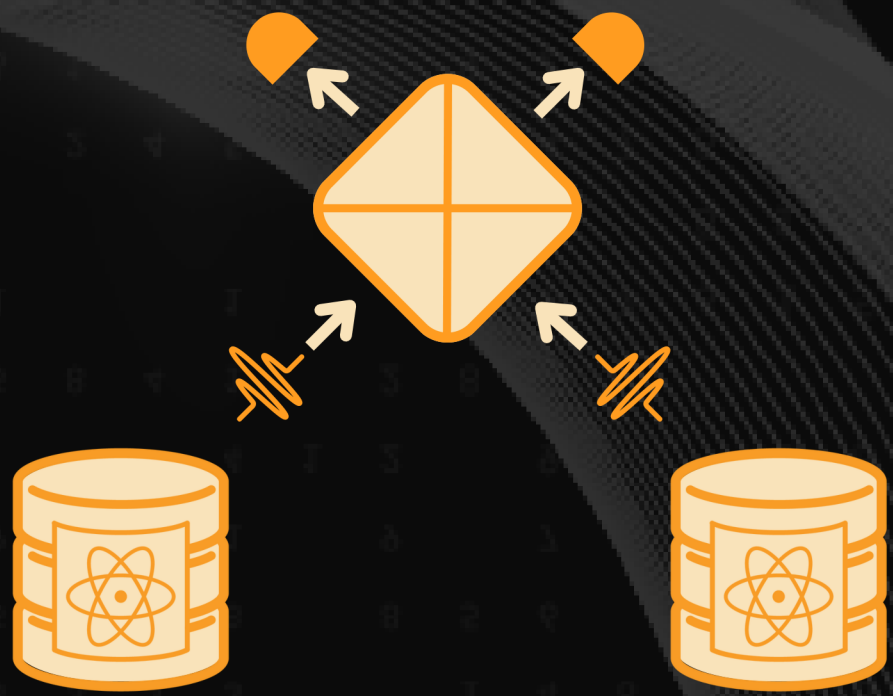
Quantum Repeaters: Internal Design

Bell State Measurement
measures then characterizes entanglement between the two particles (photons)

Quantum Error Correction
mitigates decoherence and other errors that may occur during transmission due to environmental factors

Classical Communication Channels
share quantum operations and implement error correction



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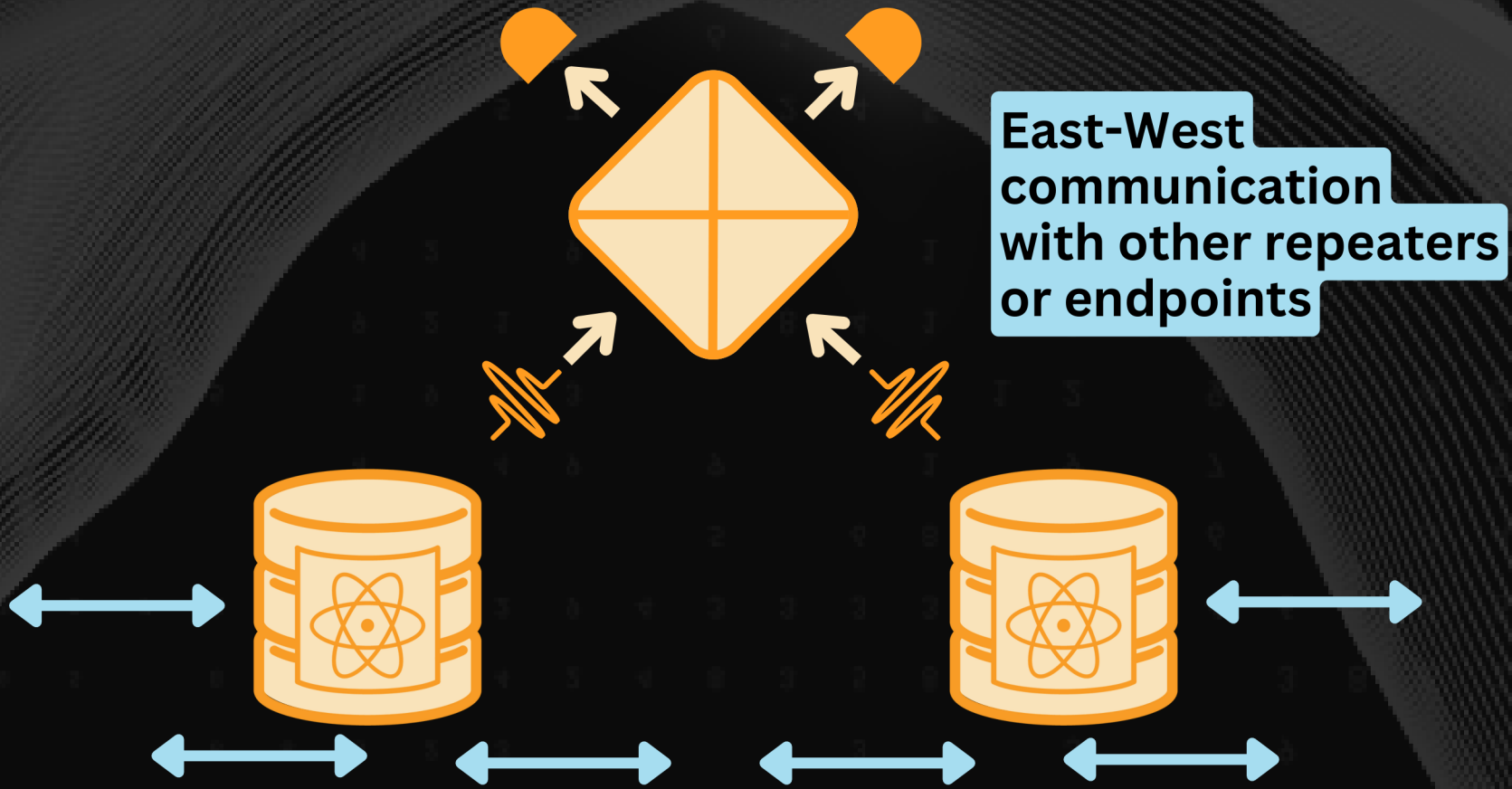
Quantum Repeaters:
Internal Operation
Configuration, Communication, & Protocols



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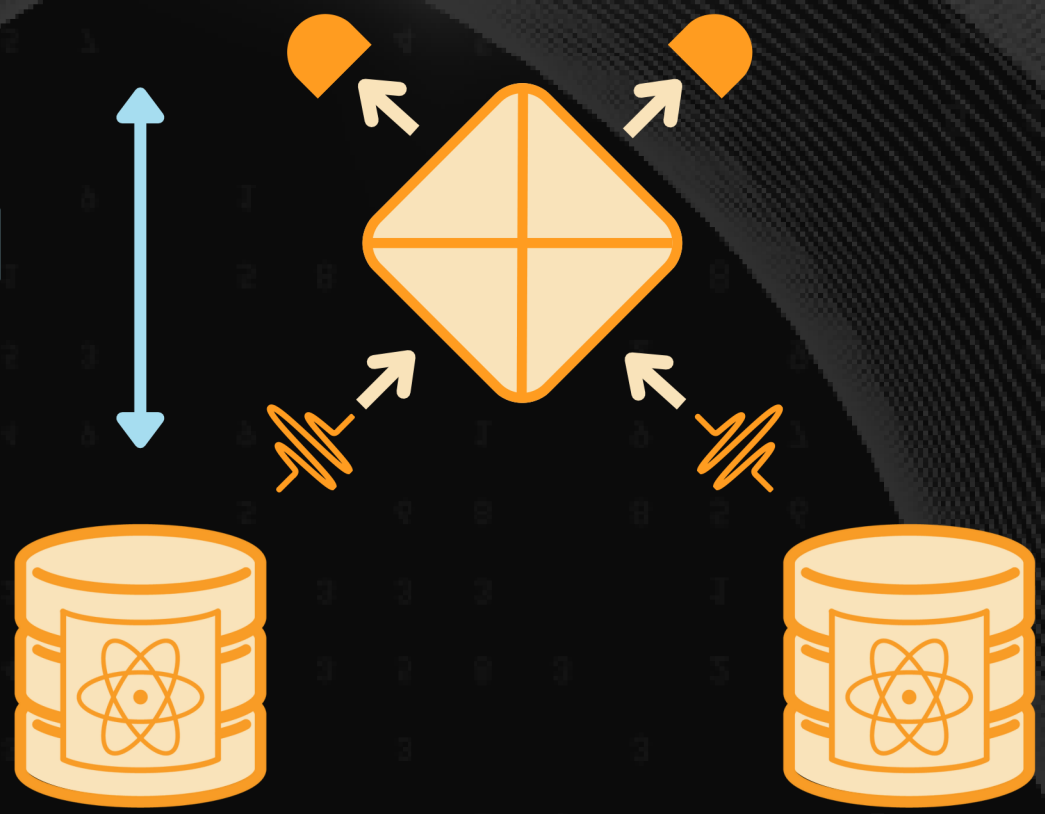
Internal Entanglement, Interoperability, Parameter Setting, Timing, Real Time Configuration

Quantum Repeaters:
Internal Operation
Configuration, Communication, & Protocols

North-South communication with system controller and orchestrator



Internal Entanglement, Interoperability, Parameter Setting, Timing, Real Time Configuration

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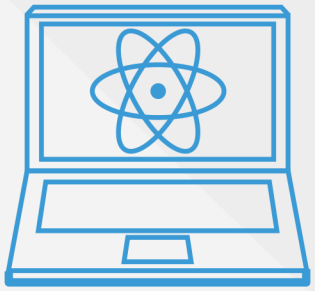
Advanced Secure Networking

Entanglement-based Networks for

Advanced Secure Communication



Secure Access to AI Cloud and Data Centers

Secure Cloud Access

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