Welcome to CERN!

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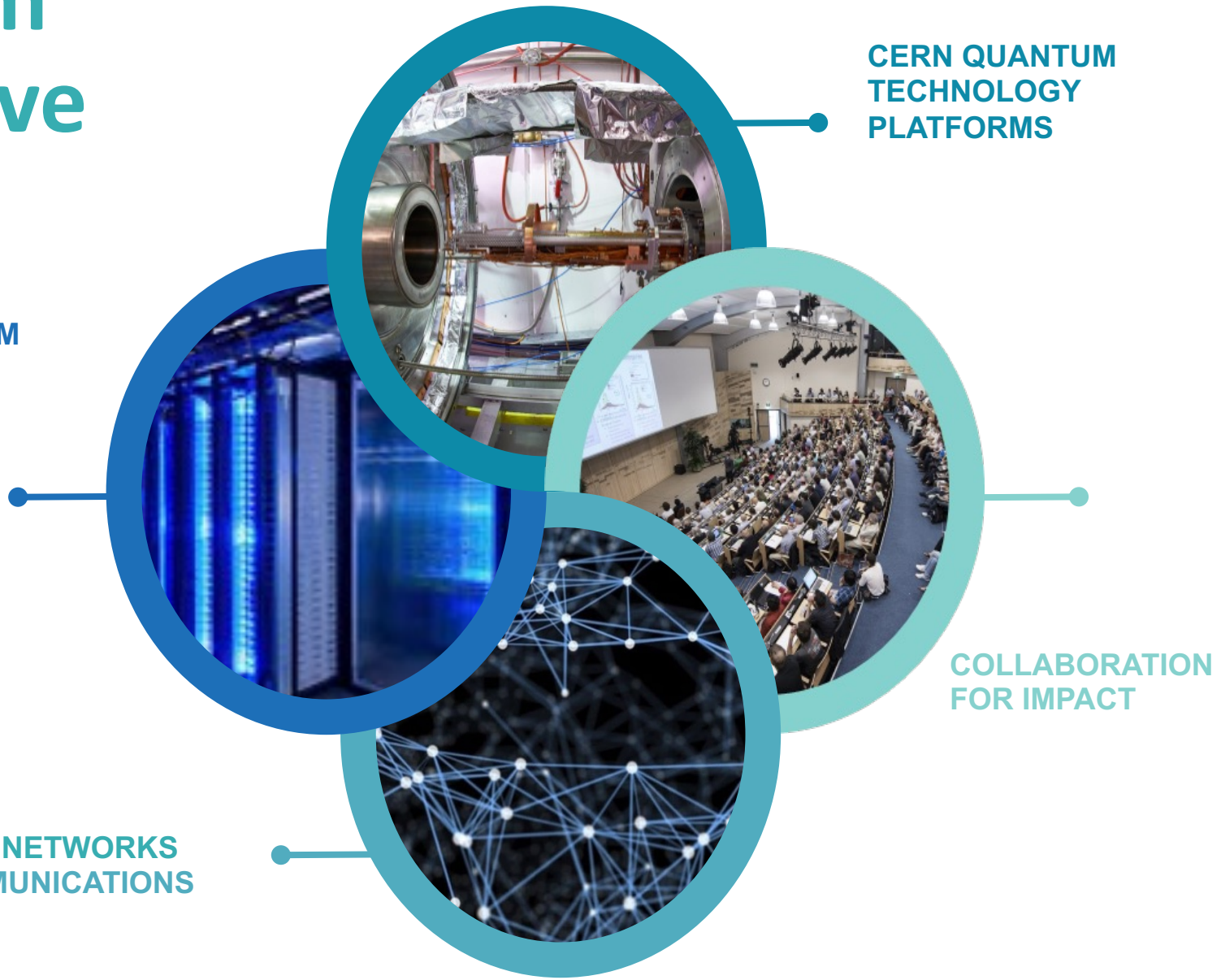
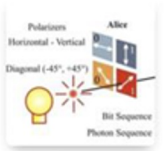


CERN | QUANTUM TECHNOLOGY INITIATIVE

Quantum Key Distribution



Key Generation

Technology

This demo explains how QKD works and shows how to use the Quantumacy QKD simulator to generate secure symmetric keys using the BB84 protocol.

Health Check Score

Healthcare

This demo shows how to protect the privacy of personal information transmitted through Internet connections using keys generated by the QKD protocol.

Chest MRI Classification

Medical Research

This demo shows how to implement a simple image classification pipeline over QKD-secured networks using homomorphically-encrypted images.

Secure Federated Learning

Technology

This demo explains how to extend Federated Learning frameworks to use symmetric keys generated by QKD to secure the communication between the computing nodes.

Parkinson's Symptoms Classification

Healthcare

This demo shows an application of secure federated learning to classify Parkinson's tremor symptoms from wearable and portable sensor devices. The links between the analysis

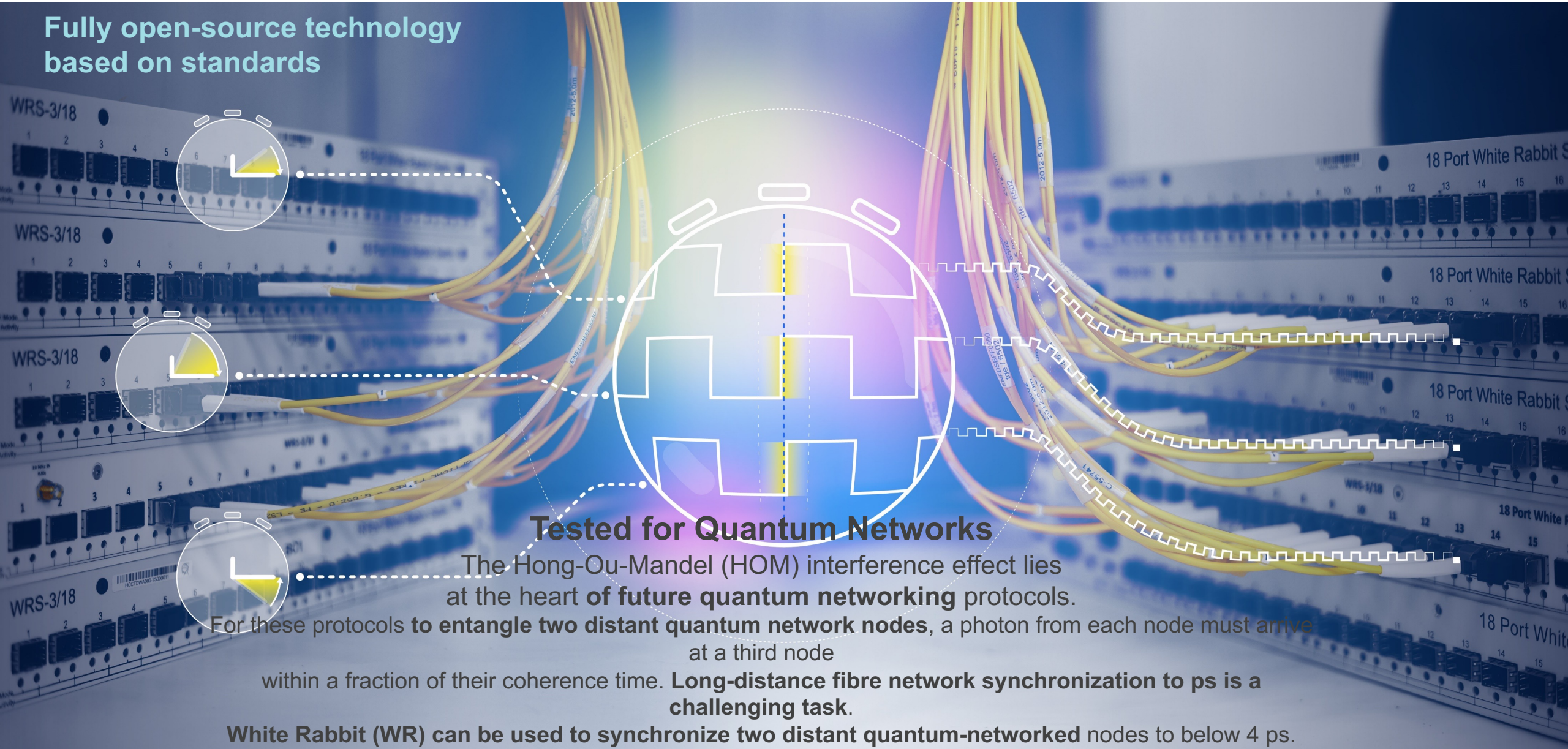
Secure Block Chains

Technology

This demo shows an example of a block chain framework to record and validate transactions across a distributed data analysis pipeline using keys generated by the QKD infrastructure.

Presented at the openQKD General Assembly

White Rabbit Technology



Tested for Quantum Networks

The Hong-Ou-Mandel (HOM) interference effect lies at the heart **of future quantum networking** protocols.

For these protocols **to entangle two distant quantum network nodes**, a photon from each node must arrive at a third node within a fraction of their coherence time. **Long-distance fibre network synchronization to ps is a challenging task**.

White Rabbit (WR) can be used to synchronize two distant quantum-networked nodes to below 4 ps.

…towards quantum internet…

A central role in the development of an open quantum infrastructure and communication inter-network

Image credit: vecteezy.com

Thank you

Enjoy the workshop!