



Quantum Overarching System Architecture Concepts

Building a secure Quantum Communication Infrastructure in the European Union

What is the project

Considering the **looming quantum threat to cyber security**, a 'Declaration of Cooperation' with the **European Commission** has been signed to explore the development of a **secure Quantum Communication Infrastructure (QCI)**.

The goal is to ensure the Union's capacity to cope with **tomorrow's cyber security challenges** and keep its governments, institutions, critical infrastructure, industries and citizens, safe and secure.

The European Commission has recently launched a «**Study on the System Architecture of a Quantum Communication Infrastructure**» with the objective to:

Provide public actors across Europe with a means to protect their critical communications by using quantum-secured communication channels

Start building a quantum internet network that would allow the complete transfer of quantum information and thus more applications beyond the field of security

Kick-start a European ecosystem in quantum technologies

What are the project's benefits



The QCI's first function will be to allow an **ultra-secure quantum key distribution**



A combination of **terrestrial and space implementation of quantum-based communication infrastructure** can guarantee security of digital transactions over short and long distances, ideally covering both the EU and other

What is our role in the project

Our experts are involved in the **Security and Risks** pillars in both classical and quantum perspectives as well as the **OSA Design**. The objectives are to define **Quantum Communication Infrastructure (QCI)** security gains and ensure a secured by design system:

- 1 State of the art analysis on QCI security services**
 - Analysis of existing missions and protocols
 - Consolidation with QCI researchers and physicists
 - Analysis of security levels for quantum key distribution services
- 2 Architecture risk analysis Overarching System Architecture (OSA)**
 - Risk analysis of the project by using the EBIOS Risk Manager risk analysis method
 - Analysis based on preliminary use-cases
- 3 Definition of QCI security gains**
 - Investigation to identify how the QCI could increase the security of sensitive data and how it could evolve in the future (i.e quantum money, quantum digital signature, quantum anonymous transmission, delegated quantum computing etc.)
 - Definition of security gains set in regards to current communication infrastructure
- 4 Security for Overarching System Architecture (OSA)**
 - Close work with all QOSAC partners to ensure that the OSA Design evolves in a secured way

12 partners from 5 countries

-  ADVA Optical Networking SE, GE
-  Airbus Defence and Space SAS
-  CNRS Sorbonne Université
-  IDQuantique
-  Institut Mines Telecom/ Telecom Paris
-  Max Planck Institute for the Science of Light

-  Orange SA
-  Technische Universiteit Delft
-  Tesat-Spacecom GmbH & Co. KG
-  PWC EU Services EESV
-  TNO
-  Veriqloud

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