Press Release

AIT AND DEUTSCHE TELEKOM CONSORTIUM DESIGN THE EUROPEAN QUANTUM COMMUNICATION INFRASTRUCTURE

AIT is an international center of excellence for quantum technology, driving key implementation initiatives to create a secure networked European Union

Vienna/Bonn/Brussels, 9 December 2021 (AIT): After the European Commission selected the **QSAFE** (Quantum Network System Architecture for Europe) consortium to design the European Quantum Communication Infrastructure last April, the interim results have now been delivered. They include a system architecture, security analyses and initial network dimensioning and lay the foundation for future implementation of the **EuroQCI** (European Quantum Communication Infrastructure Initiative) network. The aim of this state-of-the-art network is to enable information and data to be transmitted and stored in a highly secure manner and to provide a high level of protection for critical communication systems, making an important contribution to achieving the strategic aim of data autonomy in the European Union.

The key to security

The background of the **EuroQCI** initiative and the associated European research projects is that established encryption methods such as RSA (Rivest, Shamir, Adleman) or DH (Diffie-Hellman) will no longer remain secure against quantum computer attacks. This poses a threat to all modern communications and makes the switch to post-quantum encryption essential. Quantum key technology is based on physical laws of nature which provide an inherent protection against eavesdropping. In future, state-of-the-art encryption systems will be used to protect critical infrastructures, confidential private or governmental information against attacks and criminal activities.

At the end of July 2021, Ireland was the last of the 27 EU Member States to sign the EuroQCI Declaration, in which the Member States, the European Commission and the European Space Agency agree to work together to build a secure quantum communication infrastructure.

The QSAFE study

The **QSAFE** study centres around the production and distribution of quantum secure keys (quantum key distribution, QKD). The first users will include the European Union, EU Member States and additional government-related agencies.

The study, conducted over fifteen months, follows the 'security-by-design' approach and provides the basis for building a European quantum infrastructure including both fibre-based terrestrial and

satellite-based components. It is the follow-up of an initial feasibility phase conducted in 2020, with the same consortium, then led by Thales.

The QSAFE study is part of the European Union's strategy to join forces with a strong European high-tech industry to advance the development of a quantum communication infrastructure and to secure data autonomy in the EU over the long term.

Who is who in the European quantum technology landscape

The QSAFE consortium led by Deutsche Telekom gathers European partners with a 20-year background in quantum communications for the EU quantum infrastructure: the **AIT Austrian Institute of Technology** has gained an excellent international reputation as a specialist in both terrestrial and satellite-based quantum technologies and has coordinated a range of major European projects, including the highly competitive European Quantum Flagship programme aimed at developing quantum technologies for the mass market. The quantum researchers are currently working on miniaturising the devices required for quantum communications and also focus on the development and implementation of pilot experiments in Europe.

Deutsche Telekom (coordinator of the QSAFE study) and **Telefónica** contribute their fundamental know-how to plan, build, and run a quantum communication network. Both companies have already installed quantum testbeds in Madrid and Berlin as part of European research activities, and are investigating the interaction between quantum technology and established network equipment.

Thales is a global leader in complex, critical security systems for defence, transport, aerospace, and critical infrastructures. The company contributes its expertise in cybersecurity and cryptography. **Thales Alenia Space** covers all aspects of satellite-based QKD.
Associate partners from academia and from highly specialized companies are additionally involved in the project.

The QSAFE consortium closely collaborates with several national government representatives, ensuring that EuroQCI aligns with national and European security policies.
The combination of large European network operators, system integrators, network suppliers for optical communication networks and aerospace components as well as top experts from universities and research institutes forms the ideal framework to design the optimal European quantum key distribution network.

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