QUANTUM INFORMATION TECHNOLOGY

Quantum information technology is a rapidly growing field that leverages the principles of quantum mechanics to process, store, and transmit information. This interdisciplinary field gather experts from various disciplines, including physics, computer science, mathematics, and engineering, to develop new technologies that exploit the unique properties of quantum systems. Quantum information technology encompasses several subfields, such as quantum computing, quantum key distribution, quantum cryptography, and quantum communication, all of which have significant potential for solving some of the most challenging problems in science and technology. Although still in the early stages of development, quantum information technology is already showing promising results in various application domains. In this context, many standards organizations have initiated the work in this field to contribute to the development of this technology.

MAIN TECHNICAL COMMITTEES ON QUANTUM TECHNOLOGY STANDARDIZATION

- International level -

➢ ISO/IEC JTC 1/WG 14 – Quantum information technology

Standards	0	Projects	4	National delegates	3

Scope

ISO/IEC JTC 1/WG 14 serves as a systems integration entity to focus on JTC 1's standardization program on Quantum Computing and maintain relationships with other related ISO and IEC/TCs and other organizations. It was established with following Terms of reference.

1) Serve as a focus of and proponent for JTC 1's standardization program on Quantum Computing. Identify gaps and opportunities in Quantum Computing standardization.

2) Develop and maintain a list of existing Quantum Computing standards produced and standards development projects underway in ISO/TCs, IEC/TCs and JTC 1.

- European level -

➢ CEN/CLC/JTC 22 – Quantum Technologies

Standards	0	Projects	0	National delegates	0

Scope

The JTC shall produce standardization deliverables in the field of Quantum Technologies including quantum enabling technologies, quantum sub-systems, quantum platforms & systems, quantum composite systems as well as quantum applications covering the following areas: Quantum metrology, sensing and enhanced imaging, Quantum computing and simulation; Quantum communication and cryptography, as well as provide guidance to other technical committees concerned with Quantum Technologies.
The JTC shall also consider the adoption of relevant international standards and standards from other organisations, like ISO/IEC JTC 1 and its subcommittees. The JTC shall produce standardization deliverables to address European market and societal needs, as well as underpinning EU legislation, policies, principles, and values.

➢ ETSI/ISG QKD – Quantum Key Distribution

Standards	14	Projects	11	National delegates	0

Scope

To develop GSs (ETSI Group Specifications) describing quantum cryptography for ICT networks. Quantum Key Distribution is the essential credential in order to use quantum cryptography on a broad basis. It is the main task of the QKD ISG to specify a system for Quantum Key Distribution and its environment.

The activities of the QKD ISG will be performed in close co-operation with relevant standards activities within and outside ETSI. External relationships will be established where and when ever needed, Formal relationships will be established using the normal ETSI processes via the ETSI Secretariat.

MAIN PUBLISHED STANDARDS ON QUANTUM TECHNOLOGY

ETSI/ISG QKD Quantum Key Distribution	
ETSI GS QKD 018 V1.1.1 (2022-04)	Quantum Key Distribution (QKD); Orchestration Interface for Software Defined Networks
ETSI GS QKD 015 V2.1.1 (2022-04)	Quantum Key Distribution (QKD); Control Interface for Software Defined Networks
ETSI GS QKD 015 V1.1.1 (2021-03)	Quantum Key Distribution (QKD); Control Interface for Software Defined Networks
ETSI GS QKD 014 V1.1.1 (2019-02)	Quantum Key Distribution (QKD); Protocol and data format of REST-based key delivery API
ETSI GS QKD 012 V1.1.1 (2019-02)	Quantum Key Distribution (QKD); Device and Communication Channel Parameters for QKD Deployment
ETSI GS QKD 011 V1.1.1 (2016-05)	Quantum Key Distribution (QKD); Component characterization: characterizing optical components for QKD systems

MAIN ONGOING PROJECTS ON QUANTUM TECHNOLOGY

ISO/IEC JTC 1/ WG 14	
ISO/IEC DIS 4879	Quantum computing — Terminology and vocabulary
ISO/IEC TR 18157	Information technology — Introduction to quantum computing
ISO/IEC PWI 18670	Information technology — General requirements for quantum resource simulation platform
ISO/IEC PWI 18660	Information technology — Quantum machine learning datasets
ETSI/ISG QKD Quantum Key Distribution	
ETSI GS QKD 005	Quantum Key Distribution; Protocols and Security Proofs
ETSI GS QKD 010	Quantum Key Distribution (QKD) Implementation security: protection against Trojan horse attacks in one-way QKD systems
ETSI GS QKD 013	Quantum Key Distribution (QKD) Characterisation of Optical Output of QKD transmitter modules
ETSI GS QKD 015	Quantum Key Distribution (QKD) Control Interface of Software Defined Networks
ETSI GS QKD 016	Quantum Key Distribution (QKD); Common Criteria Protection Profile - Pair of Prepare and Measure Quantum Key Distribution Modules
ETSI GS QKD 017	Quantum Key Distribution (QKD); Network architectures
ETSI GS QKD 020	Quantum Key Distribution (QKD); Protocol and data format of REST-based Interoperable Key Management System API
ETSI GS QKD 021	Quantum Key Distribution (QKD); Orchestration Interface of Software Defined Networks for Interoperable key management system

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