# Quantum-enabled distributed cloud computing

**Cloud computing service connected in a quantum network with QKD and QRNG quantum communication systems and quantum-as-a-service solutions.**


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## Contact information

**Address:** Laboratorio Cuántica, GIICC, S02 Edificio Cedint, Campus de Montegancedo, UPM 28223 Pozuelo de Alarcón, Madrid
**Phone number:** 910673130
**Email:** vicente.martin@upm.es

– Ask for availability

## Technological Offers type

Technological scientific services

## Research and innovation areas

- Digital Technologies, Artificial Intelligence, Cybersecurity, 5G, Robotics
- Security, Defense and Disaster-Resilience

## ODS


**Available from:** 2026

## Where?

Computer Simulation Research Centre Quantum Information and Computing Research Group (GIICC)

Keywords: | cloud | cyber security | deep technology | quantum | quantum network

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### Description of Services Provided

Quantum network technologies for quantum communication are a complex but essential emerging field for certain high value-added applications. Quantum cryptography, such as quantum key distribution (QKD), and quantum random number generation with systems such as QRNG, are particularly noteworthy. However, these solutions are expensive, both in terms of the cost of the quantum systems and their optical network infrastructure, which prevents the development of proofs of concept or other demonstrations for research, innovation, training, or test-before-invest tasks. This service provides virtual machines on up to three nodes of the Madrid quantum network at the UPM, connected via QKD systems and with access to QRNG, as well as other quantum-enabled services such as quantum-protected tunneled connectivity.

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### Field of application

This service can be essential in proofs of concept or tests for applications where information security is critical. It enables a long-term protection approach that includes the proper management of the threat of quantum computing to cryptographic techniques. Therefore, it can be critical in any application that relies on such protection: secure interconnection of data centers, protection of critical infrastructure, secure telecommunications networks, or specific-purpose applications. Random numbers generated with QRNG can also be particularly useful in other areas, such as Monte Carlo optimization.

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**Differential Advantage**

The GIICC group has extensive experience in this field. It has acquired, deployed, and evaluated much of Madrid's quantum communications infrastructure (MadQCI ecosystem), as well as collaborating on its interconnection with other QCIs. These infrastructures have also enabled different experimental services, including secure communication of all types of information. MadQCI is divided into application scenarios, which also implies specialization in quantum network systems for different applications; examples include telecommunications backbone networks, data centers and cloud, high security, and ultra-precise synchronization.

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**Service description**

The service will be provided as agreed and according to the needs that arise. This may include one or more virtual machines on one or more nodes of the quantum network, as well as other features specific to each service. Beyond the provision of the technological service, the service may also include consulting, training, test-before-invest, support in drafting requests for proposals, support in installation and commissioning, or evaluation of cloud environments with quantum technologies, etc.

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**How to apply**

Please contact vicente.martin@upm.es, with a copy to aj.sebastian@upm.es, who will provide further information in complete confidentiality and without any prior commitment.