

Software Defined Multidomain Quantum Secured Network Field Trial

Emerging 5G services are cloud based services that often require connectivity between end users and remote data centres traversing multiple administrative and network technology domains. These services are increasingly relying on optical transport technologies to meet stringent end-to-end low-latency and high-bandwidth requirements of 5G. Additionally, security is becoming an important aspect of emerging 5G services that has to be provided in end-to-end fashion. Current Quantum Key Distribution (QKD) secured networks are mainly based on point-to-point, static and short distance links on dedicated fibre connectivity.

In order to use QKD effectively for security in a 5G network, it requires major technology advancement including support for integration with dynamic classical communication networks, integration with network control plane and capability for supporting long distance and multidomain connectivity.

Smart Internet Lab

The Smart Internet Lab is a unique interdisciplinary research hub, combining more than 200 digital experts from around the world. We aim to address key limitations of our current internet system, improving scalability, lowering latency and increasing bandwidth.

High Performance Networks Group

The High Performance Networks (HPN) Group is part of the Smart Internet Lab and specialises in the application of advanced hardware and software technologies, targeting the dynamic, autonomous and programmable networks.



The High-Performance Networks (HPN) group is focusing on security for dynamic optical networks utilising QKD technology. HPN has pioneered development of technologies such as software defined quantum secured optical networks and dynamical switched quantum secured mesh optical networks.

These technologies have been deployed in the 5GUK Test Network for securing the optical network segment of an end-to-end 5G network including front-haul, back-haul and metro network.

Field Trial

Members of the HPN group and QET Labs are demonstrating for the first time a quantum secure multi-domain end-to-end connectivity from 5G access points in the city centre to a remote data centre in Bradley Stoke on the outskirts of Bristol. The sites are connected using the metro optical network of the 5GUK Test Network and the EPSRC funded National Dark Fibre Facility (NDFF). For the first time, the field trial also demonstrates dynamic switching of a quantum secured connectivity using a QKD aware Software Defined Network (SDN) control plane in a quantum meshed network scenario.

5GUK Test Network

The University of Bristol has deployed 5G capability in Bristol city centre focusing on the convergence of fibre infrastructure and 5G wireless access.

