University of BRISTOL

Smart Internet Lab

Fully meshed dynamically switched QKD Metro network

The need to support a vast variety of devices and applications in the 5G era is drastically transforming the optical transport networks design. New schemes must exhibit enhanced dynamic characteristics, as well as providing low latency, high bandwidth and reliable connectivity requirements.

The distributed and dynamic nature of the 5G networks is mainly powered by:

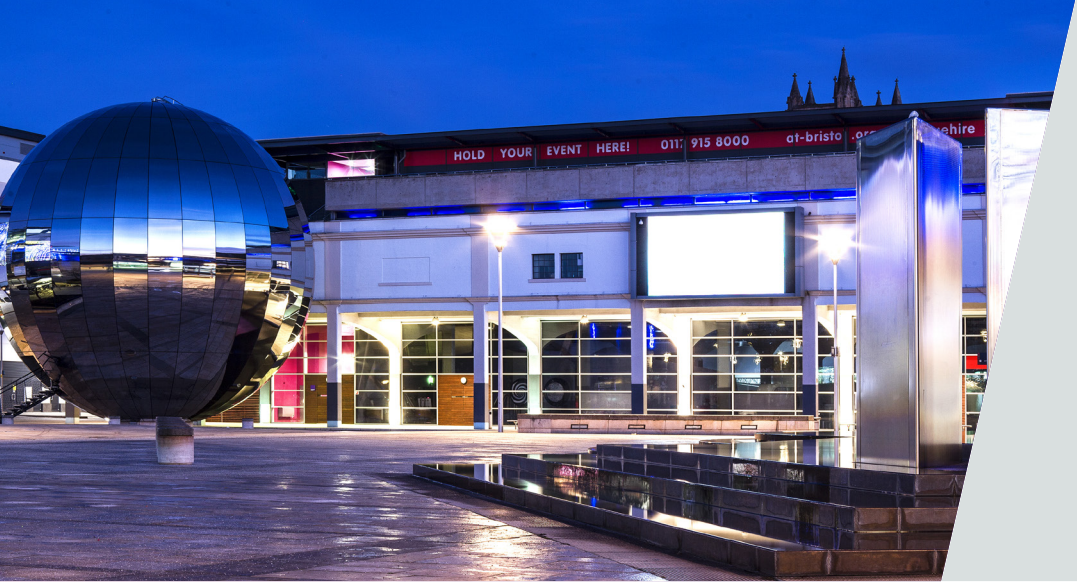
1. the fact that compute resources are moving to the edge of the network to fulfill the low latency requirements; and
2. the complete functional disaggregation needed to facilitate the seamless and reliable interconnection of different applications by creating new services with mixed and matched HW and SW resources distributed across the network.

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.



Field Demo

In this demonstration, the High Performance Networks group is demonstrating for the first time a field trial of a fully meshed network with dynamically switched QKD capabilities that comprises four optical network nodes across Bristol city. The four sites include the 5G access point in Millennium Square and Cathedral Square as well as the University Campus nodes of HPN Group and the Quantum Engineering Technology Labs. The four sites are connected through the metro optical network of 5GUK Test Network to demonstrate simultaneous classical/ quantum dynamic switching using a QKD aware Software Defined Network (SDN) control plane to achieve quantum secured connectivity in a meshed network scenario. Dynamic capabilities are also demonstrated by automatically re-arranging the QKD network to mitigate a denial of service (DOS) attack.

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.