



## CONFINE

Community Networks Testbed for the Future Internet

Through the CONFINE project, the University of Luxembourg has benefited from European research funding.

### Connected communities for the internet of the future

**1** Classic public WiFi networks offered by one main provider are currently being complemented by community-based ones, where individual WiFi subscribers open their WiFi access to other users. These emerging community-based networks are a successful model for the internet of the future in Europe and around the globe. In order to further develop and exploit this concept, the CONFINE project aims to federate existing community networks constituted by more than 20,000 nodes and offer an open platform available for developing and testing new, experimental technologies. The University of Luxembourg's Interdisciplinary Centre for Security, Reliability and Trust (SnT) has contributed to this initiative with a study on how to handle data protection and confidentiality in community-based networks.

CONFINE brings together community networks, research institutions, non-profit organisations and SMEs from Austria, Belgium, Greece, Germany, Italy, Portugal, Spain and the United Kingdom and integrates and extends three existing community networks: Guifi.net in Catalonia, Spain, FunkFeuer in Vienna, Austria and AWMN in Athens, Greece. These community networks incorporate a large and wide variety of commodity wireless and optical links, heterogeneous WiFi nodes, different routing protocols and applications. They also have a large number of end-users who benefit from an innovative model of self-provisioning using unlicensed and public access.

#### Creating a testbed for new technologies

By having integrated these networks, the project has developed a unified access to an open and user-friendly testbed with tools that allow researchers to experiment with services, protocols or

applications on real-world community IP networks. The testbed is available for anybody interested in developing and testing experimental technologies for open and interoperable network infrastructures.

CONFINE has organised two open calls to offer their facilities to external experimenters from academia, industry and other community networks. The SnT's Secan-Lab group, headed by Professor Dr Thomas Engel, participated in the first call. The SnT proposal was part of the 5 proposals out of 37 that were accepted for funding.

### How to ensure privacy in open networks

Community-based WiFi networks are valuable for users who can gain internet access in new locations, but they are not without dangers. When users connect to a community network, they access a domain controlled by a potentially untrustworthy operator. It is possible for owners of guest access points to obtain private information of users and link it to individuals, for example by analysing cookies, visited IPs, unencrypted session data or fingerprinting physical devices. Nowadays, this does not even require special skills as deployable hacker tools are freely available and easy to use. Finding ways of ensuring that private data remains confidential is therefore crucial.

The Secan-Lab's project studied data protection and confidentiality issues. How can existing privacy-preserving routing techniques that the lab has developed be transferred and tailored to the needs of users in community-based networks? CONFINE provided the lab with an ideal opportunity to test methods that it has specially designed for environments with limited resources and no central point of trust, such as community networks.

The SnT researchers deployed their own state-of-the-art, privacy-preserving routing algorithms to measure performance indicators such as latency and throughput as experienced by the end-users. As a result, the Secan-Lab was able to recommend measures that will allow users to surf the internet via community-based networks without worrying about their privacy.



The Seventh European Framework Programme for Research and Technological Development (FP7) was the European Union's main financial instrument to support European Research during the 2007-2013 period. The funding programme will continue under Horizon 2020, the Framework Programme for Research and Innovation, supporting a wide range of research domains with a budget of € 79 billion (2014-2020).