

The business case for wireless services & spectrum use for NRENs

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Introduction

Bring your own device and mobile communications are becoming extremely important within higher education and research domains. Trusted, open, hi-speed, affordable and reliable wireless access to the Internet is therefore hugely important. In this paper we address the question whether NRENs should invest much more effort and funds into wireless technology. The outcome of several studies and experiences will provide input for an NREN to build a sustainable business model around wireless services.

This session will answer questions towards investments and expected savings concerning wireless networks. Besides, the use of becoming a mobile virtual network operator for NRENs, the use of so called white spectrum and the willingness to pay for wireless services by institutes and their students and employees is discussed. It will feed the discussion whether NRENs and institutes should shift investments from the fixed network towards wireless technology.

NRENs and wireless, what is the business case?

NRENs have always invested into wired infrastructures to obtain fast, reliable, open and affordable access to the internet for their constituency, not being dependent of the generic business models of telecom operators. However, the bottleneck of network infrastructure now appears at the edge of the networks: the wireless access networks at and beyond office and campus. This rises the question whether NRENs and institutes should rely on the market or should be more in the driving seat.

SURFnet identified activities where it can complement the market with providing services, tailored to the need of education and research. More generalized, four programs can be distinguished:

- 1) Provide its users with excellent wireless access to the NRENs R&E wired network infrastructure;
- 2) Enlarge the footprint of eduroam both at national and international level
- 3) Stimulate the structural use of mobile technology within education and research
- 4) Research and use new wireless technologies

1. Provide users with excellent wireless access to NRENs R&E network

The deployment and management of Wireless networks is traditionally beyond the domain of traditional NRENs, and the responsibility of the local institute for Wi-Fi, and the operator for cellular (3G/4G) radio technology. Current developments within these domains are not necessarily in the best interest of or users. In the first place, most institutes are dealing with Wi-Fi capacity and management issues on their own, trying to keep budgets low. Second, mobile operators tend to ask high prices for commodity services.

Therefore, NRENs should take their responsibilities:

1. NRENs should not only encourage, but also cooperate with mobile operators to provide services that meet the demands of the educational and research sector. This can be done by
 - a. A joint research program for technology and user need. In the 4G research pilot in the Netherlands, for example, SURFnet researches seamless roaming between 4G and Wi-Fi together with Dutch telecom operator KPN and Tele2.
 - b. Gather demand, where institutes tender homogenous mobile service, tailored for the use for education and research. Currently, SURFnet is investigating the feasibility of a tender and the results can be shared during TNC.

NRENs should help institutes dealing with the problems on the wireless access layer, searching for balance between responsibilities and possibilities. This is not restricted to Wi-Fi, but also applies to other technologies such as private LTE and distributed antenna systems. In this aspect, a specific frequency solely for educational and research purposes might sound like a perfect idea. But a lot of concerns are included, such as specific end-user equipment, frequency licenses and obligations involved,...

2. Enlarge the footprint of eduroam

Some believe that there is no future for Wi-Fi, as it will suffer from its own success. Others believe that Wi-Fi has a future as it is open and new standards and technologies will bring better use of the spectrum. SURFnet sees Wi-Fi still as opportunity to have uniform wireless access at locations where many people gather, maintaining their own devices and subscriptions. Also, institutes are seriously interested in having eduroam Wi-Fi on train stations and city centers as this provides free and safe internet access to their users on places where they gather often. This enables researchers and students to cooperate on other places than the campus and gives campuses the opportunity to use buildings more efficiently.

NRENs should therefore consider tendering eduroam coverage at these places by investigating the willingness to pay at their customers and/or fund providers. SURFnet will share experiences as tendering is prepared early 2013.

3. Stimulate structural use of mobile technology within education and research

SURFnet works with ICT staff, teachers and researchers at institutes to determine their joint need for mobile applications, devices and infrastructure. By coordinating and financing the development of intra-institutional mobile software, SURFnet brings more value to its customers by becoming more knowledgeable and experienced in applying mobile technology for educational and research purposes. Furthermore, by taking this role, SURFnet can provide guidance for new and existing

mobile services to become fully compatible with the SURFconext platform in order to let staff and student cooperate in a trusted manner: anywhere, anytime, any device.

4. Research and use new wireless technologies

The current way of allocating and using radio frequencies does not and will not provide enough bandwidth to serve our users in the future. Therefore, governments, vendors and other parties will have to cooperate and find new ways to allocate, use and share radio frequencies. Currently, possibilities for flexible spectrum are studied, to develop a vision for the use of these possibilities in an NREN context. An example of this is the use of “white space” frequencies. These frequencies are only used in specific environments and regions and can therefore be re-used safely somewhere else. A study conducted in 2012 shows the possibilities for flexible spectrum usage in general and for NRENs in particular.

Conclusion

There is a role for NRENs within the wireless domain. NRENs have to think beyond fiber infrastructure and need to invest into knowledge, partnerships, technology and infrastructure to be able to guide students, researchers and (ICT-) staff within the potential of this technology.

Author biographies

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