

Title: Making a MEAL of eduroam over 4G



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Abstract:

eduroam is a successful roaming network access federation built upon Wi-Fi. This presentation reports about the creation of an eduroam-like mechanism for federating network access based upon UMTS and/or LTE data connectivity. In doing so, the presentation addresses - among other things - the additional challenges resulting from the involvement of third party commercial network providers, the protection of eduroam credentials, and accommodating the charging models of the providers.

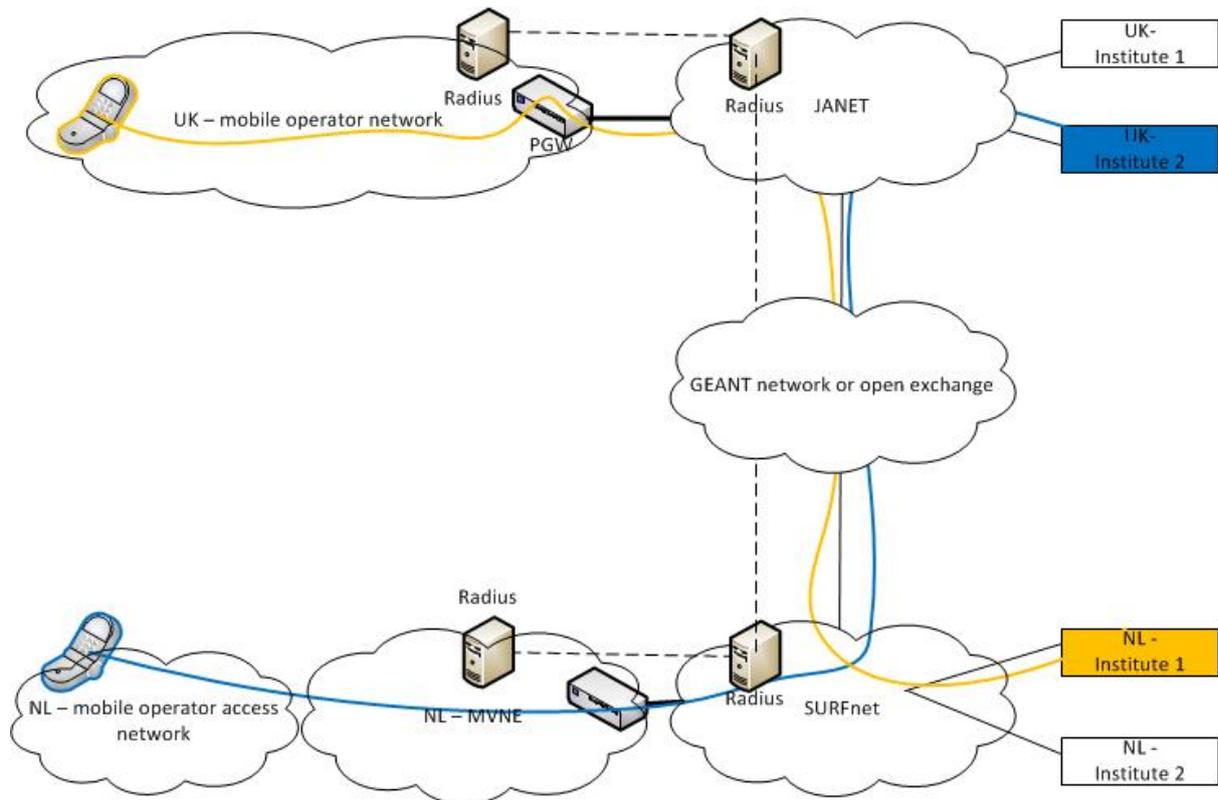
One of the strengths of eduroam is that it works between organisations, both nationally and internationally. In extending eduroam to 3G and 4G networks, we envision a situation where an NREN interconnects with a national mobile operator that offers 3G/4G mobile services. The key challenge in realising an eduroam-like service with 3G/4G networks is that people can use it everywhere in the world, at the same conditions. The eduroam component is the use of eduroam credentials in a privacy-preserving mechanism identical to Wi-Fi authentication to add an authorisation step to gaining access to 4G connectivity. At least two NRENs are needed to explore the concept of extending eduroam from a Wi-Fi centric service to a service that can also be used over the range of wireless communication networks that are used by mobile operators (2G/3G/4G).

Exploring two alternative routes

The presentation will report on two routes of access: Alternative 1 is that the visited NREN routes the user's traffic to the Internet. In contrast to the current architecture used by mobile operators, we aim at a situation where the traffic does not need to first pass the user's home mobile operator before it is routed to the internet. Alternative 2 is that the visited NREN switches traffic (on layer 2) to the ICT infrastructure of the user's home institute. This gives users access to their local ICT facilities, as if they were on campus. It allows the institute's IT department to offer transparent ICT services to their users. One of the consequences of the transparent service offering is that the institute's resources can be accessed without the need to set-up a VPN. VPNs require significant processing power which negatively affects the battery life of a mobile station. The use and maintenance of VPN software for smartphones and tablets differs significantly from that of laptops. The institutes determine whether Alternative 1 or Alternative 2 is used could. It could be based on either the authorisation attributes received from the home institute or by selecting the desired APN on the mobile device.

Alternative ways to connect to 3G/4G mobile operators

Two alternative approaches are explored to connect the mobile operator to the NREN's infrastructure. In approach 1, Janet orders an APN from a national operator. APN stands for Access Point Name and is the primary location where data leaves the network domain of the mobile operator and enters the Internet. SURFnet explores the feasibility of leasing a LTE Packet Gateway and integrate this functionality in their infrastructure. By doing this, SURFnet explores the impact of becoming a Mobile Virtual Network Operator (MVNO). SURFnet has already implemented approach 1 as part of their LTE activities with Tele2 and with KPN, which have previously been reported to TNC, in [1].



Results

The presentation during TNC2014 will consist of sharing the lessons learned and the results gained during the first phase of the project named MEAL. MEAL stands for Multi-domain eduroam across LTE and was granted by Geant3Plus in the framework for open call proposals. Project MEAL started in October 2013 and lasts until December 2014.

Acknowledgements:

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References:

[1] F. Panken, M. van den Akker, H. Teunissen, "4G on a campus site and the integration with eduroam", TNC 2012.

Author biographies:

Frans Panken works as technical product manager at the middleware services department of SURFnet. He is involved in various mobile activities, including Wi-Fi, cognitive radio and LTE. Frans joined SURFnet in 2010, after having worked for several years for Bell-Labs, the research department of Alcatel-Lucent. Frans holds an M.Sc. in applied mathematics and a Ph.D. in computing science.

Mark O'Leary is Janet's Head of 'Above Net' Service Development, with a group currently focusing on innovation in the areas of videoconferencing, access & identity management, and mobility. His background is as a technical specialist in wireless and network access control, and he has been active in the UK's deployment of eduroam. Before entering the field of academic IT, he was a molecular biologist and has postgraduate qualifications in Biotechnology and in the History of Science and Technology.