Wi-fi will soon reach its limits: Dutch study

June 11 2012

Wi-Fi, the well-known standard for wireless internet, is reaching its technical limits. Its efficiency drops significantly in busy surroundings where many different networks and numerous wireless internet enabled devices are operating. In some cases, it may even drop to less than 20 percent. This has emerged from exploratory research being carried out by the University of Twente's CTIT research institute, on behalf of Radiocommunications Agency Netherlands. The increasing demand for bandwidth means that the efficiency of Wi-Fi is likely to fall still further in future. For this reason, the researchers think that we should consider the option of a new Wi-Fi standard.

In practice, your wireless Internet connection (Wi-Fi) is almost always slower than the speed indicated on your router's packaging. It is becoming less of an exception and more of a rule for connections to achieve only half of their advertised speed. Roel Schiphorst, a researcher at the University of Twente's CTIT research institute, points out that this is mainly because the technology has remained largely unchanged since the Wi-Fi standard was introduced in the 1980s. Yet more and more wireless networks are being set up, and there has been a huge growth in the number of devices that use Wi-Fi connections.

Dr Schiphorst points out that "Wi-Fi has become an inefficient method of communication. Increasing use of the Wi-Fi spectrum probably means that we can expect ever more problems in future". According to Taco Kluwer of Radiocommunications Agency Netherlands, who is both the customer and co-investigator for this study, "one of our jobs is to monitor the spectrum by this means, and to report our findings. It is

important that manufacturers explore ways of improving the Wi-Fi standard in busy scenarios. That way, we can continue to use this great technology for many years to come."

In places where numerous wireless networks are active, or where large numbers of wireless-enabled devices are operating, each individual network experiences a loss of efficiency. This is because the more devices that are simultaneously using a network, and the more active networks there are, the greater the amount of bandwidth consumed by various control mechanisms, rather than by actual data traffic. In busy surroundings, the bandwidth used for actual data traffic can drop to less than 20 percent. This was revealed by research carried out by Jan-Willem van Bloem and Roel Schiphorst (who are holding positions in the University of Twente's Signals & Systems Group, which is headed by Professor Kees Slump) and by Taco Kluwer (of Radiocommunications Agency Netherlands). This study was commissioned by Radiocommunications Agency Netherlands. The results will soon be published in the *Journal of Green Engineering*, Special Issue on Cognitive Radio.

Provided by University of Twente