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Assessing the potential opportunities of user provided connectivity

Abstract

User-provided connectivity or UPC offers an alternative to traditional infrastructure-based mobile communication services. It relies on users willingness to share their home base connectivity with roaming users, in exchange for either reciprocation or some form of compensation. This model of service offering was initially largely popularized by FON, but has since seen several other instances of deployment, often in the context of mobile networks offload. The service is of particular interest, not only because of its potential for low-cost mobile connectivity, but also because it is an instance of a service that exhibits both positive and negative externalities. More users means better coverage and more connectivity alternatives, i.e., a positive externality, but it also implies greater odds of having to share one's own connectivity, i.e., a negative externality. The tug of war between positive and negative externalities together with the fact that they often depend not just on how many but which users adopt, make it difficult to predict the service's eventual success. In this talk, we explore the conditions under which such a service offering may be successful, i.e., capable of generating significant welfare, and investigate the role of pricing in not just realizing a successful deployment, but also as a means for implementing different trade-offs between welfare and profit maximization.

* This is joint work with M. H. Afrasiabi

Biographical Sketch

Roch Guérin received an engineer degree from ENST, Paris, France, and M.S. and Ph.D. degrees in Electrical Engineering from Caltech. He joined the Computer Science and Engineering department of Washington University in Saint Louis in July 2013 as Department Chair and the Harold B. and Adelaide G. Welge Professor. Prior to joining Washington University, he was with the Electrical and System Engineering department of the University of Pennsylvania, which he joined in October 1998 as the Alfred Fitler Moore Professor of Telecommunications Networks. Prior to joining Penn, he spent a number of years at the IBM T. J. Watson Research Center in a variety of technical and management positions. From 2001 to 2004 he was on leave from Penn, starting Ipsum Networks, a company that pioneered the concept of route analytics for managing IP networks.

Dr. Guérin has published extensively in international journals and conferences, and holds more than 30 patents. He has also been active in standard organizations such as the IETF where he has co-authored a number of RFCs. His research is in the general area of networked systems and applications, from wired and wireless networks to social networks, and encompasses both technical and "economic" factors that affect network evolution. Dr. Guérin has been General Chair or Program co-Chair for a number of ACM and IEEE sponsored conferences, and served as editor for several ACM and IEEE publications, including serving as the Editor-in-Chief of the IEEE/ACM Transactions on Networking between 2009 and 2013. He joined the ACM Publications Board in 2013.

Dr. Guérin is an ACM (2006) and IEEE (2001) Fellow. In 1994 he received an IBM Outstanding Innovation Award for his work on traffic management. He received the IEEE TCCC Outstanding Service Award in 2009, and was the recipient of the 2010 INFOCOM Achievement Award for "Pioneering Contributions to the Theory and Practice of QoS in Networks." He was also the co-recipient of the 2010 INFOCOM Best Paper Award for the paper entitled "On the Feasibility and Efficacy of Protection Routing in IP Networks." He was on the Technical Advisory Board of France Telecom for two consecutive terms from 2001 until 2006, on the Technical Advisory Board of Samsung Electronics in 2003 and 2004, and the Scientific Advisory Board of Simula Research from 2010 until 2013. He joined the Scientific Advisory Board of SITI (University Lusofona) in 2012, and the Scientific Committee of the Laboratory of Information, Networking and Communication Sciences (LINCS) in 2013.