1.4 QoE in Cooperative Wireless Networks

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Abstract: Cooperative Wireless Networks (CWN) have become an attractive alternative for providing ubiquitous and inexpensive connectivity for the mobile users. In CWN certain public and popular spaces may facilitate the appearance of the problem of sporadic user congestion; the occurrence of this local congestion adversely impacts the network and the user, degrading the application throughput, therefore the Quality of User Experience (QoE).

The permanent connectivity is a desirable requirement for any user, along with the advantages that this entails such as the availability and have the information at your fingertips, nowadays the users wants to use their mobile devices to become accessible and get interested data according to location and context where they are, from anywhere, at any time, this makes the CWN a low-cost alternative that satisfy in some extent this high degree of connectivity.

Although CWN are a promising solution for the current trends, the lack of a planned growth of the network, and centralized management make the network components are vulnerable to saturation due to the growing demand for this type of access. For example, if one access point is overloaded, it is necessary to distribute the load between different networks components.

When unbalanced load in the wireless network exists, it is desirable looking for neighboring underutilized access points (AP); but the challenging task is hard, because there are unknown factors which hamper the network load balancing and an efficient AP selection such as new traffic patterns in WLAN, type of user applications, number of users, currently load condition of the AP, handover latency, unplanned grow process and mobility patterns of the user. Another issue is finding an efficient and secure way to allow the exchange of information about the network features between APs in different domains, considering an approach without centralized controller.

This work concentrates on how to improve and optimize the user application throughput through a dynamic resources management scheme on the Wireless Community Network. The focus lies on determining the current traffic patterns in order to select the able access point providing the best service according to user requirements, and manage the existing user connections when resources are scarce. To reach this goal, a AP-selection algorithm has to be created and implementation of the standard IEEE 802.11e in the APs in order to allow to the user improve his/her QoE.