Asymptotic Analysis for Extremely Dense WLANs

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ABSTRACT

As mobile devices such as smart phones, pads or watches increase recently, there have been rapid changes in the patterns on accessing wireless Internet. In particular, demands on real-time services through the Internet have become ubiquitous over the last few years. As a massive increase in mobile data traffic is expected in the near future, it is required to develop methods or technologies for handling extremely dense wireless networks. The wide availability of Wireless Local Area Networks (WLANs) provides the possibility of solving this issue.

In this talk, we present our analysis on an extremely dense WLAN with a novel Medium Access Control (MAC) protocol, called the renewal access protocol (RAP). The RAP is recently proposed as a substitute of the IEEE 802.11 distributed coordination function (DCF) which is a dominant MAC protocol in today’s WLANs. It is shown in [1,2] that the RAP achieves optimal throughput, high short-term fairness, and near-optimal delay performances. In this work, we provide the asymptotic analysis of the RAP where the number of devices goes to infinity. We show that the RAP achieves the same optimal throughput performance either the network is dense or not. We also provide a simple method to achieve the optimal throughput performance.

REFERENCES
