Hybrid LTE-802.11ac network: Qos optimality evaluation of the voip codecs techniques

ABSTRACT

In response to the growing demand for higher quality Voice over IP (VoIP) communication, there are multiple high-speed access links, including Wi-Fi and Long Term Evolution (LTE) for the mobile end-users. The combination of the access links provides a hybrid network environment in which the end-users can switch from one to another, whichever provides a higher level of VoIP quality of service (QoS). Apart from the type of the access link, the VoIP codecs are also another key factor that directly affects the overall QoS of the voice communication. Due to inherent characteristics, different networks have distinct limitations and requirements. Considering these differences, the visualizing and analysing the performance and behaviour of each codec on its underlying network will lead to a proper VoIP codec selection, which in turn will result in optimal voice QoS for the mobile end-users. This study proposes a method to quantify and analyse the performance of different VoIP codecs in a hybrid LTE-802.11ac network in which the mobile end-users have two corresponding network interface cards. The aim is to find the codecs that suit the most for LTE and 802.11ac networks and thereby optimize the QoS of the VoIP communication. The NS3 tool is used to develop and implement a variety of distinct scenarios within which different QoS performance metrics are precisely measured. The obtained results signify the extensive impact of the codecs on the QoS of the voice communication for both LTE and 802.11ac users and also the importance of the VoIP codec selection procedure for each network.

Keyword: 802.11ac; Hybrid LTE-802.11ac; LTE; QoS; VoIP codecs