

ABSTRACT

The development of Information and Communication Technology is fast or making communication can now be easier, faster and more effective and is accompanied by the increase in the number of cellular users which causes the increase in communication traffic at cellular networks. To overcome the increase in communication traffic at cellular networks this thesis proposes the use of Device-to-Device (D2D) communication system. D2D communication is one of the features in 5G technology, where communication is directly between two mobile users instead of going through the evolved Node B (eNB) such that it can reduce communication traffic density, improve efficiency energy, improve spectral efficiency. However, the disadvantage use of the communication system cause interference to cellular telephone communications.

This thesis models and evaluates the QoS-Aware Resource Allocation (QARA) heuristic algorithm for channel allocation and communication mode selection to increases throughput for users of D2D communication, and ensures QoS for cellular communication users and D2D communications.

The final results are to show that QoS Aware Resource Allocation (QARA) Algorithm is proven to be used to allocate channels and minimize interference. This is indicated by the results of the analysis which produce better performance parameters such as sum rate, spectral efficiency, throughput, and energy efficiency.

Keywords: *Device-to-Device (D2D), a QoS-Aware Resource Allocation (QARA) algorithm, Signal to Interference plus Noise Ratio (SINR), Throughput.*