

Interference Management Techniques for Device-to-Device (D2D) Communication in 5G Networks: A survey

Abstract

The astronomical escalation in wireless data traffic has attracted serious attention recently. With an estimated over fifty billion devices on the cellular network by the end of 2020, the current infrastructural status will be insufficient to service the anticipated demands. As a result, talks on the 5th generation (5G) are in progress at both the academic and industrial levels. Apart from improved capacity; energy efficiency, decreased latency (near zero), and heightened reliability have been foreseen as defining characteristics of 5G. This would, however, be accompanied by a lot of issues and pressure on the cellular network. Device-to-Device (D2D) communication is one of the proposed solutions to the anticipated problems. With D2D communication, proximal devices can form links directly to each other, thereby reducing the pressure on the Base Stations (BS) significantly, and improving reuse of spectrum, throughput, coverage, energy efficiency, and reduction of end-to-end latency. Furthermore, it will create a medium for more peer-to-peer as well as location-based services. Interference management between D2D and Cellular User Equipment (DUEs and CUEs) is seen as a critical success factor in the deployment of D2D communication, since both sets of UEs share same licensed spectrum. In this paper, a survey of some existing approaches to interference management in a D2D-enabled (two-tiered) 5G network. Further analysis of the surveyed interference management schemes reveals the inadequacies of the techniques to address on their own, the inherent incidences of cross-tier and co-tier interfering signals in two-tiered 5G networks, and hence give room for further research.