Review of adaptive cell selection techniques in LTE-advanced heterogeneous networks

ABSTRACT

Poor cell selection is the main challenge in Picocell (PeNB) deployment in Long Term Evolution- (LTE-) Advanced heterogeneous networks (HetNets) because it results in load imbalance and intercell interference. A selection technique based on cell range extension (CRE) has been proposed for LTE-Advanced HetNets to extend the coverage of PeNBs for load balancing. However, poor CRE bias setting in cell selection inhibits the attainment of desired cell splitting gains. By contrast, a cell selection technique based on adaptive bias is a more effective solution to traffic load balancing in terms of increasing data rate compared with static bias-based approaches. This paper reviews the use of adaptive cell selection in LTE-Advanced HetNets by highlighting the importance of cell load estimation. The general performances of different techniques for adaptive CRE-based cell selection are compared. Results reveal that the adaptive CRE bias of the resource block utilization ratio (RBUR) technique exhibits the highest cell-edge throughput. Moreover, more accurate cell load estimation is obtained in the extended RBUR adaptive CRE bias technique through constant bit rate (CBR) traffic, which further improved load balancing as against the estimation based on the number of user equipment (UE). Finally, this paper presents suggestions for future research directions.