ABSTRACT

This study designed sub-optimal degree distribution using coded random access (CRA) on binary erasure channel (BEC). The multiple access method used in this study is CRA which is considered more suitable for super dense networks with a very large number of users. In multiple access CRAs, users are differentiated based on degree distribution. The degree distribution here represents the number of transmits, users and time-slots. CRA is random, where each user is free to choose the time-slot to be transmitted. Sub-optimal degree distribution is designed based on repetition codes in the CRA. This research uses the BEC channel, because it is designed at the OSI network layer. Each user node (UN) and slot node (SN) in a bipartite graph has a degree distribution seen from an edge perspective and node perspective. The degree distribution obtained will later be used to simulate an extrinsic information transfer (EXIT) chart. The sub-optimal degree distribution obtained is $\Lambda(x) = \frac{1}{4}x^2 + \frac{2}{4}x^3 + \frac{1}{4}x^4$ *with rate R=0.33 and offered traffic G=0.8. The results of the EXIT chart simulation obtained in this study have a small gap between curves so that the resulting loss rate is also small. When G=0.2 the resulting PLR value is 0.0001 and the resulting throughput value is 0.2 packets/slot. At the time G=0.4 the PLR value is 0.0002625 and the throughput value is 0.399 packages/slot. At the time G=0.6 the PLR value is 0.0005 and the throughput value is 0.5997. At the time G=0.8 the PLR value is 0.1489 and the throughput value is 0.6809 packets/slot. At the time G=0.1 the PLR value is 0.7787 and the throughput value is 0.2213 packets/slot. The highest throughput occurs when the number of users is 160 and the number of time-slots is 200.*

Keywords: coded random access, EXIT chart, packet loss rate.