



A Review Of The Mobile Cell Selection In 4G LTE-A Networks

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Abstract

High demands for broadband mobile wireless communications and the emergence of new wireless multimedia applications constitute the motivation to the development of broadband wireless access technologies in recent years. The Long Term Evolution/System Architecture Evolution (LTE/SAE) system has been specified by the Third Generation Partnership Project (3GPP) on the way towards fourth-generation (4G) mobile to ensure 3GPP keeping the dominance of the cellular communication technologies. Through the design and optimization of new radio access techniques and a further evolution of the LTE-A systems. Cell selection is the process of determining the cell(s) that provide service to each mobile station. In particular, we study the new possibility available in OFDMA & SC-FDMA based systems, such as IEEE 802.16m and LTE-Advanced, of satisfying the minimal demand of a mobile station simultaneously by more than one base station. We formalize the problem as an optimization problem and we presents how the mobile unit establishes this connection with the strongest cell station in vicinity. To do this, the mobile unit has to overcome the challenges of estimating the channel to communicate with the cell site and frequency synchronization. Also, multiple mobile units communicate to the same receiver and from various distances. Hence, it is up to the mobile to synchronize itself appropriately to the base stations. LTE-A uses two signals, the Primary Synchronization Signal and the Secondary Synchronization Signal sequentially to determine which of the available cell sites a mobile would lock in to. While inter-cell interference (ICI) one of problems for the downlink and uplink of multi-cell systems (in general) and OFDMA& SC-FDMA networks (in particular).

Keywords: *LTE, LTE-A, OFDMA, SC-FDMA, cell searching , cell selection, inter-cell-interference.*

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