

Overload Control for Massive Machine Type Communications

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Massive machine type communication (MTC) is one of the use cases for IMT-2020. Concurrent accesses of a cellular network by mass MTC devices may result in intolerable delays, packet loss, or even service unavailability to human-to-human (H2H) communication services. Hence, proper overload control mechanisms are required to guarantee network availability and quality of H2H services under heavy MTC load. In this lecture, we introduce the current 3GPP Long Term Evolution Advanced (LTE-A) random access procedure and the radio access network overload control solutions within LTE/LTE-A. An overview of the several considered overload control solutions, including the standardized Extended Access Barring (EAB) solution, will be briefly introduced. We present an iterative contending-user estimation (ICE) method for the analysis of multi-channel slotted ALOHA protocol in transient conditions and with non-stationary arrivals. We then demonstrate how to use the ICE method to model LTE-A random access procedure and estimate the RACH performance under different overload control schemes.