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Performance evaluation of voice handover between LTE and UMTS

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ABSTRACT

The main objective of seamless mobility is to enable mobile users to stay connected while roaming across heterogeneous networks. As cellular networks evolve from the third generation Universal Mobile Telecommunication System (UMTS) to the Long Term Evolution (LTE), a new Evolved Packet Core (EPC) will support heterogeneous radio access networks on the same platform. UMTS provides voice services in the circuit switched domain; while LTE operates in the packet switched domain. Cellular network operators thus face the challenge of providing voice services during initial deployment of LTE due to difficulty in mobility between the two domains. Seamless voice handover between packet switched LTE and the circuit switched UMTS network is therefore an important tool in solving this problem.

This report investigates the performance of inter-Radio Access Technology voice handover between LTE and UMTS. The schemes evaluated were Voice Call Continuity (VCC) for UMTS to LTE handover and Single Radio Voice Call Continuity (SRVCC) for LTE to UMTS handover. The performance evaluation was done using mathematical models and equations that were derived for the handover service interruption time. The resulting equations were simulated and the output was analysed and compared with the Third Generation Partnership Project (3GPP) specifications.