UNIVERSITI TEKNOLOGI MARA

SELF-ORGANIZING NETWORK (SON) BASED HANDOVER MECHANISM FOR LONG-TERM EVOLUTION (LTE) NETWORK

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ABSTRACT

The migration towards the LTE network technology meaning that many 3G, 2.5G and even for 2G (whether 3GPP or 3GPP2) network shall continue their operation for upcoming years. The advantages of LTE network are reducing the signalling overhead while sharing the common session data storage that shall enhance the resource usage and easing the network migration from previous network to LTE network. Most importantly it improve the mobility between difference access systems for examples 2G, 3G and 4G. Despite the advantages that help the network to communicate better, there is issue that often arises within the LTE network which is handover issue. Handover occurs when UE moves from one cell to another cell and sometime may cause drop calls and disrupt the communication. The main handover parameters in measurement report: Hysteresis (Hys) and Time-To-Trigger (TTT) play important roles to avoid the handover failure. Many solutions have been introduced to minimize the handover failure issues. One of the solutions is Self-Organizing Network (SON). SON mechanism comprises of three components of self-configuration, self-optimization and self-healing which can contribute to optimize the performance of the next generation broadband network such as the Long Term Evolution (LTE) networks. The aim of this study is to propose a self-organizing handover procedure based on the Self-Organizing Network (SON) concept for LTE network, The simulations scenario and analysis on the performance of the proposed SON-based handover were conducted using the QualNet software. The two main handover parameters that have been modified are the Hysteresis (Hys) and Time-To-Trigger (TTT). Several simulations were run with difference value of Hys and TTT value in order to perform good handover network performances. The outcome of the simulation shows the network performance is better after optimizing the Hys and TTT parameters value. In particular the LTE network shows remarkable improvement in the network throughput, as well as reducing the network delivery delay and network jitter thus lead to network less congestion. This study will be beneficial for future works as the next communication technologies are always changing rapidly and the self-manage mechanism will become essential for efficient network operations.

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