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Master Device Selection in Wireless Personal Area Networks

ABSTRACT

Wireless Personal Area Network (WPAN) is playing an important role in future of mobile ad-hoc wireless communications and information systems. WPAN can be viewed as another network such as 802.11 WLAN. IEEE 802.11a, b, and g which are 2.4 GHz and 5 GHz wireless LAN technologies, and Bluetooth is 2.4 GHz personal area network (PAN) standards to meet the needs of a data-hungry world for more speeds. IEEE 802.15 IEEE standards body designated to come up with wireless WPAN standards.

The WLAN standard IEEE 802.11b developed by the European Telecommunications Standard Institution (ETSI) and by Institute of Electrical and Electronics Engineering (IEEE) respectively. Both standards operate in 5GHz band which is license free band. WPAN is the system that this thesis is based on.

End of this thesis result will propose a simulation for an efficient way of Master Device selection. Two main methodologies for master device selection are “Reachability” & “Stability”. The intention here is to enhance the Master Device selection capability. Simulation results for master device selection will be presented according to the above two criteria’s and comparing with the standard master device selection based on battery power criteria. The simulation WPAN scenario in software package OPNET Modeller v11.0 will be presented.

In this dissertation, we will propose and investigate novel handover algorithm that causes handover of the Master Device quickly and efficiently in Wireless Personal Area Network (WPAN). Handover process, which needs to be fast and efficient for it not to have an effect on the mobile user’s ongoing communication, occurs when a mobile user migrates to a different channel or to an adjacent cell. The proposed handover algorithm will be presented, modeled and simulated in this thesis. WPAN standard have defined two standard handover algorithms based on Reachability and Stability for the handover of master device in WPAN. These two techniques will be combined and simulated and compared with the battery power selection technique.