UNIVERSITI TEKNOLOGI MARA

LEAST CONGESTED CHANNEL RECOMMENDATION FOR UNCOORDINATED WIFI ACCESS POINT

AG IBRAHIM BIN AG DAUD

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ABSTRACT

When Telekom Malaysia (TM) introduces Wi-Fi residential gateway to its broadband customer, TM faces the issues of Wi-Fi signal strength and Wi-Fi network performance. The convenience of wireless connectivity has increased the usage of wireless devices such as mobile phone, smart TV, tablet, wireless speaker and CCTV. The problems with wireless residential gateway arise when there is multiple access point nearby which potentially reduce the Wi-Fi network performance. These access points can cause signal interference between access points if the selected channel are the same or overlapping. Even when the signal strength is high, interference from other nearby access points that uses overlapping channel or same channel can cause degraded network performance. This congested environment is not conducive for Wi-Fi connectivity and degrades the Wi-Fi performance in term of data transmission. This research, propose a new algorithm to find the least congested channel for WiFi environment to minimize the incidence of congestion on WiFi access point (AP). This study has design channel scoring algorithm using Link Score Method, whereby the channel with the highest score were selected as least congested channel (LCC). There are five main aspects used as an input in calculating the Link Score. The five are the channel priority, RSSI, adjacent-channel, co-channel and weighted parameters.The algorithm can run on client devices such as wireless laptop, tablet and mobile phone. Once the algorithm suggested the least congested channel, TM customer shall be able to switch to the channel and expect this will reduce the signal interference and increase network performance. Testing results shows that the new algorithm are able to find least congested channel and suggested better channel compared to auto channel selection implemented by ten different access point model use in this study. All ten access point model used in the experiment are currently supplied by TM to the customers.

Keyword

Least congested channel, adjacent-channel, co-channel, received signal strength indicator, Wi-Fi, channel interference.

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