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Inhomogeneous wireless network load distribution

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Network inhomogeneity appears common as devices of different capabilities were phased in over time. As a result, households and enterprises may deploy IEEE 802.11n access points (APs) with joint use of earlier IEEE 802.11 b/g apparatus. When different generations of APs co-exist, varying coverage, capabilities, and service rates affect how a wireless station selects which AP to associate with and thus govern overall system performance. Meanwhile, in view that Android smartphones are becoming popular, we are concerned with distributing traffic among APs for wireless users, implementing the mechanism over Android under inhomogeneous network settings. In our architecture, three generations of standard APs are deployed within the same area where a server is introduced to collect user's grade points or other relevant information. We propose a grading point system as the basis of load distribution, allowing for how long an Android handset used each type of AP in the past. Such connection time is considered plus and minus, respectively, with respect to an IEEE 802.11b AP and IEEE 802.11n AP. That is, the longer a handset was associated with an IEEE 802.11b AP, the more points it gains, in favor of its eligibility to connect to an IEEE 802.11n AP later. On the contrary, the longer the handset was with an IEEE 802.11n AP, the more advantage it loses, making it less likely to use the IEEE 802.11n again in the future. According to the ranking of our grade points, the appropriate AP is designated for users to camp in. Consequently, the inhomogeneous network is shown to maintain high functionality, producing high throughput as well as alleviating the loading from newer AP, so as to achieve load sharing across APs.

Biography

Kuang-Hui Chi is an Associate Professor at the Department of Electrical Engineering, National Yunlin University of Science and Technology, Taiwan. His current research interest lies in Wireless Internet.

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