CHANNEL ASSIGNMENT USING EFFICIENT CLUSTER TECHNIQUE TO REDUCE THE INTERFERENCE IN WIRELESS MESH NETWORKS

Ashraf Alzubir Mohammad Ali, Assoc. Prof. Dr. Kamalrulnizam Abu Bakar
Faculty of Computer Science and Information Systems,
Universiti Teknologi Malaysia
ashrafalzubier@gmail.com, knizam@utm.my

ABSTRACT
Wireless mesh networks (WMNs) have gained great attention as its brightly noted in the expansion of IEEE 802.11 networks. WMNs are able to cover large spaces of areas such as institutions, government units etc. The main challenges of multiradio multi-channel assignment algorithms in WMN are their abilities of keeping the maintenance of the network connectivity (topology) as well as minimizing the interferences (channel-assignment) between mesh routers. Obtaining an optimal mesh topology and successful selection of channels are playing important roles in resulting good WMN performance. This research is divided into three phases. Firstly, its clusters the nodes into groups. Clustering the nodes serves three objectives: minimizing the interference by assigning diverse channels among clusters, minimizing the gateway overheads in process of channel assignment, and avoiding the limitation on the available channels by re-assignment the same channels in the other clusters far away from each other. Secondly, the topology control algorithm is used to enhance the selection of the subset of wireless network links, afterward, enhances the network connectivity and reducing the interference. Lastly, considering the “Data-Traffic-Load” is compulsory as its affects the topology. Affecting the topology is resulting in minimizing the WMN performance. The optimization technique is used to optimize the processes of dynamic channel assignment based on the changes caused by the traffic load. In this research, NS2 simulator is planning to use. Different network scenarios have been proposed, and will be compared and evaluated in term of WMN topology performance which is represented in successful channel assignments, throughput, interference, and network connectivity.

KEYWORD
Channel Assignment, Interferences, Connectivity, Topology Control