INTERFERENCE AWARE CHANNEL ASSIGNMENT IN MULTICHANNEL MULTI-RADIO WIRELESS MESH NETWORKS: OPTIMIZATION MODEL

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ABSTRACT
This paper presents an optimized interference aware channel assignment model in Multi-Channel Multi-Radio Wireless Mesh Networks. The proposed model helps to increase the performance of the network by reducing the co-channel interference which exists between the links. The model classifies the interfering links into four different classes (Sender Connected, Asymmetric-Incomplete State, Symmetric-Incomplete State, Flow-in-Middle) depending upon their geometric relationship with the target link. Each class of interfering link is assigned with a distinct channel through optimized spectral re-usability of non-overlapping channels available in IEEE802.11b radios. This will increase the simultaneous transmissions between the interfering links, resulting in an increase in the aggregate throughput of the network. Additionally, the capacity constraint in the model will help in the fair distribution of the network throughput between the interfering links. The proposed model is evaluated for large-sized network by using MATLAB & CPLEX. Numerical results indicate that the throughput efficiency of the proposed model is 17% higher than Cluster-Based Channel Assignment Scheme (CCAS) and 26% higher than Hyacinth. Hence, this validates the proposed model which can be served as a benchmark in the design and deployment of wireless mesh networks.

KEYWORD
Interference, Channel Assignment Problem, Multi-Channel Multi-Radio Wireless Mesh Networks