and chain. We put 100 nodes 10 by 10 at a square lattice and a triangular lattice with three different side lengths: 50m, 70m, and 90m. In a chain topology, 25 nodes are placed with three different lengths: 50m, 70m, and 90m. We compare the performance of GA with GH when 3 and 12 channels are available. GA with 12 available channels results better throughputs in all cases. In some case, GH with 12 channels also provides similar performance to GA, however, the performance of GH highly depends on the topology settings.

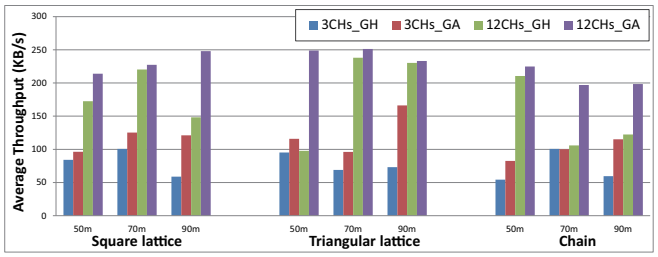

Fig. 5. Network performance in various topologies.

VI. Conclusion

In this paper, we propose the channel assignment scheme to improve the degradation of network performance caused by the hidden terminal, exposed terminal, and co-channel interference problems in multi-radio multi-channel WMNs. Since the communication, interference, carrier sensing ranges are all different in the basic 802.11 protocol, these problems are related to not only adjacent links but also the multi-hop links. We first investigate the conditions in which each problem can occur and then design the weighted conflict model which represents possible conflicts caused by those problems. To the best of our knowledge, this is the first approach considering all three problems together. We newly define *Max list-Cut* problem to solve the channel assignment problem on the weighted conflict model and present the approximation algorithm with approximation ratio 2. Since the Max list-Cut problem is a generalized version of the Max k-Cut problem, it can be used in various other problems. We show that the proposed channel assignment achieves high performance in various topologies by the simulation.

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