Voice Call Capacity Model for Hybrid Multi-Channel Protocol over Multi-Hop Multi-Channel Multi-Radio Wireless Mesh Networks

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Abstract—Multi-channel multi-radio wireless networks improve network performance by enabling more simultaneous transmissions. Among multi-channel multi-radio protocols, the hybrid multi-channel approach has been shown to be efficient in providing higher system throughput. Voice over internet protocol (VoIP) service is expected to be widely supported in wireless networks, though its capacity has not been studied in relation to the emerging hybrid multi-channel protocol over multi-channel multi-radio wireless mesh networks (MCMR WMNs). To enabling VoIP service over MCMR WMNs, the call capacity model is essential. This is because the accuracy of the call admission control highly depends on how well the call capacity over the multi-hop MCMR WMN is inferred. In this paper, we introduce a new voice call capacity model of hybrid multi-channel protocol on multi-hop MCMR WMNs. Both experimental and simulation results demonstrate that the proposed call capacity model accurately estimates the voice call capacity on a multi-hop MCMR WMN.