

## Traffic-driven exclusive resource sharing algorithm for mitigating self-coexistence problem in WRAN systems

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**Abstract:** IEEE 802.22 Wireless Regional Area Network (WRAN) is the first wireless standard based on cognitive radio (CR) technology. WRAN is designed to allow secondary users (SUs) to opportunistically utilize idle TV channels on a non-interfering manner. A major challenge in enabling efficient WRAN communications is the interference-and-coexistence problem. There are two types of co-existence; incumbent co-existence and self-coexistence. In this paper, we investigate the self-coexistence problem among multiple overlapped WRANs. Specifically, we propose an adaptive cooperative exclusive traffic-aware channel allocation scheme (TAECA) that attempts to minimize the unnecessary blocking of SU transmissions in the overlapped cells, which consequently maximizes spectrum utilization. TAECA employs a novel max-min weighted fair mechanism for adaptively allocating idle channels to the different WRANs cells depending on their prevailing traffic conditions. Simulation results indicate that compared to reference allocation mechanisms, TAECA increases the number of served SU transmissions by up to 40%, which significantly improves spectrum utilization.