Ph: 9585554590, 9585554599
Email: support@salemsmartreach.com
URL: www.salemsmartreach.com

Channel Assembling with Priority-Based Queues in Cognitive Radio Networks: Strategies and Performance Evaluation

ABSTRACT:

With the implementation of channel assembling (CA) techniques, higher data rate can be achieved for secondary users in multi-channel cognitive radio networks. Recent studies which are based on loss systems show that maximal capacity can be achieved using dynamic CA strategies. However the channel allocation schemes suffer from high blocking and forced termination when primary users become active. In this paper, we propose to introduce queues for secondary users so that those flows that would otherwise be blocked or forcibly terminated could be buffered and possibly served later. More specifically, in a multi-channel network with heterogeneous traffic, two queues are separately allocated to real-time and elastic users and channel access opportunities are distributed between these two queues in a way that real-time services receive higher priority. Two queuing schemes are introduced based on the delay tolerance of interrupted elastic services. Furthermore, continuous time Markov chain models are developed to evaluate the performance of the proposed CA strategy with queues, and the correctness as well as the preciseness of the derived theoretical models are verified through extensive simulations. Numerical results demonstrate that the integration of queues can further increase the capacity of the secondary network and spectrum utilization while decreasing blocking probability and forced termination probability.