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Data Retrieval Scheduling for Multi-Item Requests in Multi-Channel WirelessBroadcast Environments

Abstract:

Wireless data broadcast is a popular data dissemination method in mobile computing environments because of its capability of concurrently disseminating data to multiple users. In this paper, we study the data retrieval scheduling problem for multi-item requests in multi-channel broadcast environments. To maximize the number of downloads given a deadline, we define a problem called largest number data retrieval (LNDR). We prove the decision problem of LNDR is NP-hard, and we investigate approximation algorithm for it. We also define another problem called minimum cost data retrieval (MCDR), which aims at downloading a set of requested data items with the least response time and energy consumption. We prove MCDR is NP-hard to approximate to within any non-trivial factor. Therefore, we investigate heuristic algorithm for it. Finally we provide simulation results to demonstrate the practical efficiency of the proposed algorithms.