6. CONCLUSION AND FUTURE WORK

In this paper, we comprehensively studied sustainable strategy for recycling EDs in IoE networks. We formulated the problem based on the system model, and we mathematically derived the problem feasibility condition and the lower bound. Since the problem was NP-hard by nature, the heuristic MSBP algorithm was designed to minimize the number of batches while conserving the service continuity through VM migrations. Moreover, to guarantee the optimality of our MSBP, the LBUF strategy was utilized to satisfy VM migration matrices via obtaining a lower path contention level. The simulation results demonstrated the optimality of our MSBP because the heuristic solution always well matched the lower bound. In addition, the LBUF strategy actually had the better performance of allocating bandwidth and migration trajectories compared with STF. Finally, the proposed solution had the highest efficiency of recycling EDs while guaranteeing a long network lifetime. In summary, our solution well improves the network, social, economic and ecological sustainability.

In our work, the bandwidth and migration trajectory assignment strategy was utilized for all kinds of VMs. Once the differentiated sensitivity-level-aware environment—where different VMs correspond to various sensitivity-level data—was involved, the hybrid strategy combined with STF and LBUF would be designed in future, aiming at further reducing the path contention level.

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