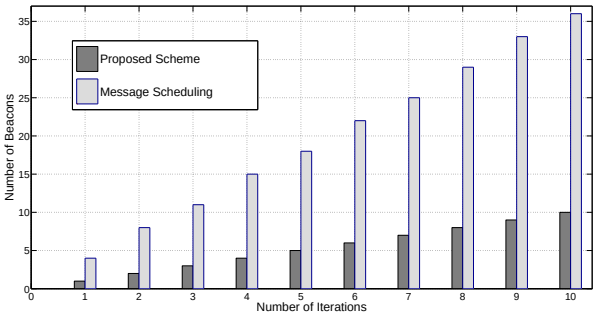

Fig. 6. Comparison beacon required between message scheduling scheme with proposed method.

The setup parameter in Fig.5 is followed by length of superframe 250 ms [3]. Thus, we saw in Fig. 5 the deliver of message M_{N_2} is deferred since message M_{N_4} have the deadline d_{M_4} less 30 ms as compared with deadline d_{M_2}. The similar behavior between message M_{N_3} and message M_{N_4}. In contrast to other message, message M_{N_1} always completed without irritation. The reason of this phenomenon, because computation time c_{M_1} eternally fulfilled and the deadline d_{M_1} second lowest after deadline d_B. Finally $\forall M_n$ is schedulable. Furthermore, the conform to theorem IV.1. Fig. 6 show compared simulation result between our scheme and message scheduling technique [6]. That our technique is needed less amount of beacons as we extend the length of superframe up to 250 ms, so more number of message be transferred in ISA100.11a Wireless Industrial Networks environment. Our methods guarantee that the exchange of data across the network successfully without interference or overlap among data in one time slot of the superframe.

VI. Conclusion

In this paper, a new application of deadline monotonic scheduling is proposed to check and test superframe scheduling and to reduce the overhead without degrading the network performance in ISA100.11a Wireless Industrial Networks environment. The performance of the proposed method is compared with the other scheme, which is message scheduling. In addition, beacon constraints are also considered in this paper. We also demonstrated the schedulability test by using the deadline monotonic policy. The simulation results showed that our proposed method required less number of beacons, compared to message scheduling. We added maximum length of time slot in superframe to reduce the overhead. Hence, the proposed method could assign more data to be sent in the network. For future work, we will examine multi-tree and multi-channel by apply Nash equilibrium approach from game theory.

Acknowledgment

This research was supported by the MSIP (Ministry of Science, ICT and Future Planning), Korea, under the Creative ICT Convergence Human Resource Development Program support program supervised by the NIPA (National IT Industry Promotion Agency).

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