

A WATCHDOG TECHNIQUE FOR DETECTING SELFISH NODES IN MANETS

R. Venkatesan

*M.E.,
Assistant Professor,
VET First Grade College,
Bangalore.*

Prof. D. Udaya Suriya

*B.E., M.E. (Ph.D.),
Assistant Professor and Head,
Department of Computer Science Engineering,
GGR College of Engineering, Vellore.*

Abstract

A mobile ad hoc network (MANET) is an infrastructure-less network with self-configuring capability of mobile nodes connected wirelessly. In mobile ad hoc network, some nodes may selfishly decide only to cooperate partially, or not at all, with other nodes. These selfish nodes could then reduce the overall data accessibility in the network along with an increase in query delay. In the past, many people have worked on this selfish node problem, and proposed several methods to detect these selfish nodes. This paper provides a survey on different methods used to detect selfish nodes in MANETs. It also provides an overview on data replication in a mobile ad hoc network, and certain methods to handle selfishness occurring in this replica allocation process. It is being proposed to use a combined credit risk and collaborative watchdog method to improve the network performance by detecting such selfish nodes within a reduced time period.

Keywords: *MANETs, Selfish Nodes, Replica Allocation, Credit Risk Method, Watchdog Method, Combined Credit Risk and Watchdog Method.*

INTRODUCTION

Mobile Ad Hoc Networks (MANETs) or simply ad hoc networks, comprise of nodes that move freely and dynamically self-organise into arbitrary and temporary network topology without any fixed infrastructure support. In a mobile ad hoc network, the mobility and resource constraints of mobile nodes may lead to network partitioning or performance degradation. The mobile nodes that are in radio range of each other can directly communicate, whereas others need the help of intermediate nodes to route their packets.

In MANET, each node acts as a router. These nodes in the network are responsible for discovering a path to a particular node and forward the data to that node. Since the nodes in the network are capable of moving, the infrastructure of network will change rapidly. Dynamic topology of MANETs may result in network partition. When network partition occurs, mobile nodes in one network are not able to access data hosted by nodes in other network. Each node in the MANET will do forward the data to other node but some nodes will not forward the data packet to other nodes, and they are called as selfish nodes.

Figure 2 illustrates the graphical representation of the detection time of both SCF-tree based credit risk method and the collaborative watchdog method. It is clear that watchdog method takes much less time to detect the same selfish nodes.

CONCLUSION

This survey paper considers various methods to handle selfish nodes in MANETs. It deals with traditional replica allocation methods such as SAF, DAFN and DCG methods. From the above survey, we understood that SCF-tree based technique is the best among the above mentioned replica allocation techniques, and a combination of this credit risk and watchdog method detects the selfish nodes within much less amount of time. The proposed method improves the data accessibility, reduces communication cost and average query delay, reduces the detection time.

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