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OPTIMIZING THE EFFICIENCY OF WATCHDOG IDS IN MANETs USING SELFISHNESS INFORMATION AND BAYESIAN FILTERING

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ABSTRACT

Mobile Ad-Hoc Networks (MANETs) are a new paradigm for wireless communication for mobile hosts. These Networks do not need the costly base stations as in wired networks or mobile switching centers in cellular wireless mobile networks. In such a network, each node acts as an end system as well as a relay node (or router). Routing protocol for MANETs are designed based on the assumption that all the participating nodes are fully cooperative. However, nodes may become selfish due to low battery life remaining. This selfishness is a characteristic property of any node which is provided by the device manufacturer so as to maximize the node life before being fail due to exhausted battery. Depending upon the probability distribution of mean number of packets to be transferred by any node in the network, one can calculate the average life of a node before it attains selfish behavior. Also, there is always a scope of intruder attacking and harming the usual functioning of the Network, which may cause a node to perform maliciously thereby forwarding packets in unusual way to the unauthorized. The watchdog is a well-known sensor usually adopted for detecting black-holes in such networks, but typical watchdogs are characterized by a relatively high number of false positive and negative cases, which can affect the effectiveness and efficiency to deal with intrusions. This paper proposes a novel approach for detecting selfish node in mobile P2P networks by using Bayesian Filtering and an estimation of the mean time to get selfish for any node.

KEYWORDS: MANET, Selfishness