



Effects of Selfish node on Routing Protocols in Delay Tolerant Network

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Abstract: Delay tolerant network (DTN) that has modest end to end connectivity among nodes. It is constructed to provide communication among the most undetermined and accent environment. To transfer messages between nodes DTN uses some predefined routing protocols like epidemic, prophet, spray and wait etc. Due to interconnectivity of nodes between sender and receiver it is difficult to find normal node or malicious node. A selfish node always uses the services of network but do not share its own assets and tries to maximize their own profit. This paper presents the DTN network and its different routing protocols. This paper also provides description about selfish node attack and how selfish node maximize their own benefits by using the different network resources and Does not share these resources among other nodes of the network. Various types of attacks by the selfish node on the networks and how these attacks effect the routing protocols are also discuss here.

Keyword: Please DTN; Selfish node; Blackhole Attack; Credit; Virtual Bank; Reputation; Routing.

1. INTRODUCTION

DTN is a way to deal with computer network architecture that plans to tackle the specialized issues in heterogeneous networks that experience absence of persistent networks. DTNs empower information exchange when portable nodes are just discontinuously associated. Because of absence of steady network, DTN routing typically takes after store carryand forward; i.e getting some bundles and a node bears them until it contacts another node and then forwards the messages. Since DTN routing rely on versatile nodes to forward bundles for each other, the routing execution (e.g., the number of messages conveyed to their(goals)depends on upon whether the nodes interact with each other or not [1]).

2. ROUTING PROTOCOLS IN DTN

There are mainly five type of routing protocols in Delay Tolerance Network which are as following:

First Contact: In this, the source node and the in-between nodes forward the message arbitrarily to a adjacent node which they meet primary. It does not need any computation to be complete at the node in order to decide the next finest hop towards the destination.

Direct Delivery: In this, the message is not forwarded to the adjacent nodes. The source node does not pass the message to the in-between nodes,

but keeps it with itself in anticipation of it comes in direct contact of the destination node [2].

Epidemic: The Epidemic routing protocol uses the concept of whole flooding for message transfer in DTN [3].

Spray and Wait: The Spray and Wait protocol provides an upgrading over the Epidemic routing protocol by controlling the level of flooding [4].

Prophet: In prophet, a concept of node prediction is used in which data is forwarded through the node having highest chances of message delivery towards destination [5].

3. SELFISH NODE ATTACK

A Selfish node is a node that uses the directing administration however does not have any desire to spend its own particular assets to coordinate towards that administration [6]. Narrow minded nodes can be portrayed by the expectation of amplifying their own particular increases or aggregate additions with coniving nodes from the system group while limiting their commitments to it. The main reasons behind this node Selfishness are, Network reservation policy. Constrained to energy or storage space.

3.1. Types of Selfishness

Social Selfishness: In this present actuality, the

larger part is socially biased. As being social, they will ahead groups for others through whom they have social ties¹, for instance, relatives and allies even at the cost of their own assets. Likewise, they give diverse inclinations to those with social ties, i.e., they will give better support of those with more grounded ties than to those with weaker ties, especially when there are resource goals. As being Selfish, they are unwilling to forward packs for those with whom they have no social ties in order to save their own stockpiling and power resources. For settlement, the above social and Selfish direct will be implied as social Selfishness.

Individual Selfishness: To the extent we know, social Selfishness has not been tended to sometime recently. While loads of directing calculations have been anticipated for DTNs, the greater part of them don't believe clients' preparation and absolutely assume that a node is prepared to forward messages for all others. They may not work honorably since a couple messages are sent to nodes unwilling to hand-off, and will be dropped. In recent large studies have measured the Selfish part of users, where Selfish nodes are empowered to forward messages for every single other node to keep up elite. In any case, these plans go to another outrageous; i.e., they accept that a node is not willing to forward messages for any other person. For ease, such Selfishness is called individual Selfishness [7].

3.2. The Impact of Selfish Behavior

The presented research works in light of hypothetical examination models and recreations uncover the accompanying two qualities of the execution debasement created by Selfish conduct. Firstly, the steering execution (i.e., conveyance proportion, conveyance cost and conveyance idleness) is genuinely debased, if a noteworthy segment of the nodes in the system is Selfish.

Secondly, the effect on the directing execution is identified with the uncooperative activity of Selfish conduct (i.e., non-sending of messages and dropping of messages). The conduct of non-sending of messages lessens the conveyance cost, while the conduct of dropping of messages builds the conveyance cost. Be that as it may, them two diminishing the conveyance proportion, and drag out the conveyance latency, even if messages are eventually delivered [8].

4. ATTACKS BY SELFISH NODE

Credit forgery attack: A Selfish node may endeavor to manufacture a substantial acknowledge (e.g., intrigue for different nodes to infuse nonexistent layers into a legitimate layered coin) to reward itself for work it didn't do or for more than it has done.

Nodular tontine attack: Unlike in a credit phony assault, while getting a multilevel credit, a Selfish node may attempt to expel one or a few existing lay-

ers that have been produced by the past sending nodes.

This assault is especially powerful in benefit sharing frameworks, where the benefits of the expelled nodes

will be shared by the rest of the nodes.

This attack is particularly effective in profit-sharing systems, where the profits of the removed nodes will be shared by the remaining nodes.

iii) Submission refusal attack: In DTNs, because of the absence of end-to-end association, a source node and other transitional nodes might not have an unmistakable thought regarding the sending advancement, and therefore, it relies on upon the last sending node to present the produced layered coins to a VB for freedom.

Notwithstanding, if intriguing with the source node, the last middle of the road node may decline to present the got credits and get behind-the-scene remuneration from the source node [8].

5. LITERATURE SURVEY

DTN security is very big challenge for researchers. Various types of security-enhancing techniques are there. Some researchers modify the existing protocols to prevent networks from selfish node attack.

In this section review of various existing papers for detection of selfish node attack has been presented. In [9] proposed a dynamical measurement method which introduces two kinds of special nodes, watchdogs and path raters. Watchdogs are used to identify misbehaving nodes, and the function of path raters is to help routing protocols to avoid misbehaving nodes.

So, the only network wider explore is replaced by FRESH into the sequence of lesser searches ensuing in cheaper route finding.

In [10] introduced Issue of routing in irregularly associated systems. In such systems there is not in the slightest degree an assurance that a completely associated way amongst source and goal exists whenever, rendering steering conventions which are customary not able to convey messages between hosts. In this manner, there is a constraint for a route trail during such networks. A protocol for probability routing named PROPHET is introduced that can deliver more messages with lower communication overhead.

In [11] proposed SPRITE, a credit-based framework to motivating forces cooperation of egotistical nodes in MANET correspondence. These incentivation strategies display a few issues, for example, the requirement for some sort of execution foundation to keep up the bookkeeping and they as a rule depend on the utilization or something to that affect of sealed equipment.

In [12] portrayed two fundamental methodologies which is furnished to manage egotistical conduct: i) inspiration or impetus based methodologies, and ii) identification and rejection. The main methodology

tries to elevate nodes to determinedly partake in the sending exercises. These methodologies are ordinarily in light of virtual money or amusement hypothesis models.

In [13] discussed different method which contract with selfish behavior. First is motivation based approaches and second is detection. The first method tries to support nodes to diligently participate in the forwarding activities. The detection and exclusion method is a straightforward way to manage with selfish nodes and many solutions have been presented.

In [14] advanced the delay-tolerant network for that circumstance, which is another perceived zone for scholarly research. Things being what they are different applications can profit by this rising correspondence worldview incorporating supporting provincial schools in creating nations, minimal effort Internet benefit arrangement, zebra following in Africa, long range informal communication, and so on.

In [15] proposed the Confident protocol, which joins a watchdog, reputation systems, frameworks, Bayesian channels and data acquired from a node and its neighbors to safely recognize getting into mischief nodes.

In [16] survey display comparable outcomes: when the proportion of childish node increments from 0 to 40 percent, then the misfortunes in the quantity of parcels is expanded by 500 percent.

6. CONCLUSION

In this paper, several literatures on Delay tolerance network and its various protocols have been reviewed. This paper explains about selfish node and types of selfish node attacks. It also discusses the types of selfishness and how these nodes harm the network and its effects on routing protocols.

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