

Strategy for maniac challenge

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1. Assumptions

We assume that every node in the network is selfish. Yet, they are willing to be cooperative in order to maximize their gains (i.e., as many packets delivered to their team nodes as possible).

Since it is not practical to run the OLSR routing agent in promiscuous mode, there does not exist a global view of the behaviors/strategies of your neighbors (e.g., whether an intermediate nodes relays the packet for you.). Yet, it is possible to build a global reputation view/table through some communication between our team nodes. Thus, a practical way to do so is to setup a feedback protocol that resides at the application level.

Assume there is a UDP based communication pipe between our team nodes (say A and B). We will exchange the following information between A and B: The ID of a node that relays packets addressed A or B. To be specific, when A received a packet that is address to itself from C, C will score a few points for its nice behaviors. Then, A will notify the group ID of C to B so that they will favor the same group of nodes. If a nodes that never relays packets for us, it will score negative points.

2. Strategies:

There are two components (i.e., local and global) that constitute our strategy. The very core of our strategy is to be selfish and cooperative. Be selfish to nodes that are not related to us. It means that we will not forward packets for a node that is not in any path

from the sources to our team nodes. Be cooperative to those nodes that can forward packets to us.

1) local strategy

- a) For each neighbor and its group, we start with a default forwarding percentage as 50% in the local reputation table.
- b) After receiving packets from a node (say C), increase the forwarding percentage for the group that C is in.
- c) For nodes that did not do anything for us, reduce their forwarding percentage. For example, if none of the neighbors are cooperative, we no longer will forward packets for them. Thus, we don't rely on getting packets from nodes other than the sources. On the contrary, if there are some nodes that can help us to forward, we naturally picks them as our forwarders.
- d) To those nodes that are not related to us (e.g., not in the path to each wither A or B), we have a low forwarding percentage even they are very cooperative.

2) global strategy

- a) Our nodes should be close to sources. Of course, each node is close to a different source. Once the entire network is not cooperative, we at least can grantee 50 percent data deliver rate.
- b) Through our high level communication to rank our neighbors so as to choose the best forwarder network wide. Our team nodes will periodically update the reputation table so as the make sure that we have same forwarding policy for each team.