Adaptive message size routing strategy for delay tolerant network

Abstract

Delay tolerant network (DTN) is a kind of computer network that suffer from the frequent disconnections, network partitioned and unstable network connectivity, therefore maintaining an uninterrupted route from source to destination is not possible. Therefore, the transmission of message is achieved via intermediate nodes by adopting a novel transmission mechanism called store-carry and forward where node stores the incoming message in its buffer, carries it while moving and forward it when it comes in the transmission range of other nodes. DTN routing protocols can be either single copy or multi copy. In single copy protocols, the node forwards the unique copy of message along a single path. These protocols suffer the long delivery delay. In multi copy protocols, the node diffuses multiple copies of same message along dissimilar paths. Thus, message can reach destination via more than one path. However, the replication process consumes high volume of network resources such as buffer space, bandwidth and node energy. The probabilistic routing strategies for instance PRoPHET Protocol minimizes the consumption of resources and forwards a message to a custodian by using a metric of delivery probability. The probability describes the suitability of a node to meet the destination of message. However, when node mobility pattern is not symmetric the probabilistic computations cannot predict the accurate forwarding decision. In this paper, we have proposed a novel message forwarding strategy called Adaptive Message-Size Routing strategy (AMRS) by which a node handovers the copy of message to its neighboring nodes by using a metric named as mean threshold (MTH). We have compared the performance of AMRS with Epidemic and PRoPHET routing protocols. The proposed routing strategy has performed better in terms of maximizing delivery probability while minimizes message drops and number of transmissions.