A Hybrid Congestion Control Strategy for Delay and Disruption Tolerant Networks (DTNs)

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Abstract: Delay and Disruption Tolerant network (DTNs) are subject to intermittent connection and long delay, thus the internet congestion control mechanism are not suited for DTNs. Some quality of service parameters suffer badly when network or part of a network is in congestion. In this work we investigate the existing congestion control techniques for simulating a hybrid scheme to control congestion.
Keywords: DTNs, Opportunistic Contacts, Intermittent Connectivity, Delivery Delay, Congestion Control.

I. Introduction:

Delay and Disruption Tolerant network (DTNs) are the networks that lack continuous network connectivity thus guarantee no end to end connection. Routing between the non-fixed locations of node is a challenging task. For DTN's there must be a store-carry and forward approach thus, more disruption tolerant than TCP/IP. In DTNs, one copy of message is not sufficient to obtain high delivery ratio, thus replication such as flooding mechanism is used. This may increase delivery ratio while considering infinite no. of network resources, on the other hand overhead is increased and also leads to congestion.

We need congestion control mechanism, to improve the performance measure of DTNs which directly affects the latency and delivery ratio. Our Research hypothesis is to investigate the existing congestion control techniques for simulating a hybrid scheme of prioritizing packets and utilizing memory efficiently for reducing latency and increasing delivery ratio.

II. Methodology:

Buffer Space Advertisement[1] is a congestion control mechanism in which each node advertizes its buffer while keeping a safety margin. The adjacent nodes decide either to forward packet or not on basis of the hello message generated by the advertising node. This work can be extended by identifying the congestion region, so that no packet is forwarded to the region which is congested. We integrates this mechanism with Path Avoidance[2] in which congestion area is identified by using node's state. Further we used EDF (Earliest deadline first) for defining priorities to the bundles which increases the performance of the simulated scenario.
We have used Path Avoidance and Buffer Space Advertisement together to generate a hybrid model. The results of the hybrid scenario show significant improvement in controlling the congestion.

III. Conclusion:

This hybrid method utilizes the network resources in an efficient way to improve the performance of network.

IV. References:

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