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Per Flow Packet Scheduling Scheme to improve the end-to-end Fairness in Mobile Adhoc Wireless Network

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Abstract : Various fairness models and criteria proposed by academia and industries for wired networks can be applied for ad hoc wireless network. The end-to-end fairness in an ad hoc wireless network is a challenging task compared to wired networks, which has not been addressed effectively. Most of the traffic in an ad hoc network are transport layer flows and thus the fairness of transport layer flows has attracted the interest of the researchers. The factors such as MAC protocol, routing protocol, the length of a route, buffer size, active queue management algorithm and the congestion control algorithms affects the fairness of transport layer flows. In this paper, we have considered the rate of data transmission, the queue management and packet scheduling technique. The ad hoc network is dynamic in nature due to various parameters such as transmission of control packets, multihop nature of forwarding packets, changes in source and destination nodes, changes in the routing path influences determining throughput and fairness among the concurrent flows. In addition, the effect of interaction between the protocol in the data link and transport layers has also plays a role in determining the rate of the data transmission. We maintain queue for each flow and the delay information of each flow is maintained accordingly. The pre-processing of flow is done up to the network layer only. The source and destination address information is used for separating the flow and the transport layer information is not used. This minimizes the delay in the network. Each flow is attached to a timer and is updated dynamically. Finite State Machine (FSM) is proposed for queue and transmission control mechanism. The performance of the proposedapproach is evaluated in ns-2 simulation environment. The throughput and fairness based on mobility for different flows used as performance metrics. We have compared the performance of the proposed approach with ATP and the transport layer information is used. This minimizes the delay in the network. Each flow is attached to a timer and is updated dynamically. Finite State Machine (FSM) is proposed for queue and transmission control mechanism. The performance of the proposed approach is evaluated in ns-2 simulation environment. The throughput and fairness based on not mobility for different flows used as performance metrics. We have compared the performance of the proposed approach with ATP and MC-MLAS and the performance of the proposed approach is encouraging.

Keywords : ATP , End-to-End fairness, FSM, MAC, QoS
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