CROSS-LAYER DESIGN FOR ANT COLONY BASED HYBRID MULTIPATH ROUTING IN MOBILE AD HOC NETWORK

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Abstract

In this paper, we have proposed a cross layer design between physical and network layers for ant colony based node disjoint hybrid multipath routing (*ACNDHMR*) in Mobile Ad hoc Network (MANET). *AntHocNet* is ant colony based hybrid algorithm, which combines reactive path setup with proactive path probing, maintenance and improvement. In MANET link failure occurs due to node mobility or power exhaustion at the node. Once a link is detected broken, an alternate route has to be discovered, incurring extra route discovery overhead and packet latency. But most of the MANET routing protocols are designed to handle either link stability or battery power. This algorithm monitors received signal strength and residual battery capacity and exploits them for routing decisions and link failure prediction. The delay caused by route reconstruction can be significantly reduced by prediction. This algorithm has been used for implementation of virtual class room (VCR). A VCR is one that can be established by using mobile devices and whose members can be dynamically added or removed. The implementation of VCR for lesson handling and query discussion using MANET has been analyzed. The data are spread among the N (here N=3) node disjoint stable routes from the beginning of the data transmission session. The performance metrics, average end-to-end delay, packet delivery ratio and load balancing have been analyzed for various pause times. The average end-to-end delay and packet delivery ratio have varied significantly. Optimal load distribution is achieved by spreading the load among different node disjoint routes.

Keywords : Mobile Ad Hoc Network, Ant Colony Optimization, Cross layer, Personal Digital Assistant, Virtual Class Room, *AntHocNet*