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Swarm Based Cross Layer Optimization Protocol for WMSN

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Article Info	ABSTRACT
	Wireless Multimedia Sensor Network (WMSN) is comprised of tiny, low cost multimedia devices such as video cameras and microphones. These networks can transfer scalar as well as multimedia data into real time as well as non-real time applications. However addition of such devices exposes additional challenges on both QoS assurance and energy efficiency for efficient use of resources. This paper presents cross layer based AntSenseNet protocol to meet various QoS requirements such as throughput, jitter, lifetime and packet delivery ratio in order to improve network lifetime. Cross layer routing protocol utilizes scheduling algorithm and AntSenseNet protocol builds hierarchical structure and able to use multipath routing protocol. Simulation results shows Cross layer based AntSenseNet protocol outperforms Ant Sense routing protocol and cross layer routing protocol in terms of throughput and packet delivery ratio.

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1.   INTRODUCTION

Advancement in wireless sensor network has shifted focus from typical wireless sensor network to Multimedia sensor network. Wireless multimedia sensor network consist of a set of low cost, multifunctional, autonomous sensors.The main objective of wireless sensor network is to detect the event (sensing) and data communication through node coordination and conservation of energy to maximize lifetime. Major area of applications of WMSN is video surveillance, telemedicine and in traffic control [1].

Introduction of video and imaging data has revealed additional challenges such as bounded delay, packet loss, minimum bandwidth, achievable data rate, cross layercoupling functionalities and strict multimedia communication time constraints. These problems are essentially examined for WMSN in order to optimize the QoS parameters like delay, jitter, throughput and packet loss [2].

In sensor network, Sensor nodes communicate with each other to detect events, aggregate and process data depending on the application, and to transmit the sensed information to the base station by hopping the data from node to node [3]. The sensor nodes are deployed either randomly or according to statistical distribution which is predefined, over a geographic region of interest (ROI). Wireless sensor network consists of various sensor nodes that are used to monitor any target area like forest fire detection by our army person and monitoring any industrial activity by industry manager [4].

When network scales up, routing becomes more challenging and critical. Careful resource management and delivering the collected multimedia data in WMSN is most important in WMSN. Swarm intelligence based routing protocol can be used for efficient resource management. One of the most