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A QOS BASED MULTICAST COMMUNICATION FRAMEWORK FOR WIRELESS SENSOR ACTOR NETWORKS (WSANS)

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Abstract. *Wireless sensor and actor networks (WSANs) are formed by the collaboration of sensor and actor nodes. Whenever there is occurance of an event of intrest, i.e., object detection, earth quake, water level detection, sensor nodes sense it and send information to the actors. Actors are responsible to take prompt decisions and react accordingly. In some situations, it is required to send event data to a group of nodes simultaneously in a certain time period. Multicast routing is an efficient way to disseminate event information to multiple destinations. Therefore, an efficient and reliable multicast routing is required for wireless sensor actor networks. In this paper, we propose a QoS based multicast routing (QMR) protocol and coordination framework for WSANs. QMR provides multicast routing using actor directed clustering protocol, which configures the sensor nodes in the form of clusters and propagates the event information to multiple cluster heads as well as actors. The multicast problem is formulated as a Linear Integer Program whose objective is to minimize the number of active sensor nodes in setting multicast routes such that data are received by all the members of multicast group. Simulation results show that, by using ADCMP, cluster heads efficiently deliver data to actors with minimum delay that helps for taking a quick action and thus serving its purpose of sensing and reacting in the deployment field.*

Keywords: Wireless sensor and actor networks (WSANs), Clustering algorithm, Multicast routing, QoS

1. **Introduction.** Wireless sensor networks (WSNs) are rapidly gaining interests of researchers from academia, industry and defense. WSNs consist of a large number of sensor nodes and a few sink nodes deployed in the field to gather information about the state of physical world and transmit it to interested users, typically used in applications, such as habitat monitoring, military surveillance, environment sensing and health monitoring. Sensor nodes have limited resources in term of processing power, battery power and data storage. Nodes in WSNs are passive, which can only monitor the events of interest and thus they are unable to react in the environment. Sensor nodes use wireless interfaces for communication and have short range due to limited energy [1]. In many applications, however, only observing the state of the physical world is not sufficient. It is also sometimes necessary to respond to the sensed events by performing corresponding actions. For instance, in a fire handling system, the actors need to turn on the water sprinklers on receiving a report of fire. This leads to the emergence of wireless sensor actor networks