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Under Water Sensor Networks Routing Protocols

Dr.A.Kathirvel

Abstract - Recently, sensor networks have emerged as a very powerful technique for many applications, including monitoring, measurement, surveillance and control. The idea of applying sensor networks into underwater environments (i.e., forming underwater sensor networks) has received increasing interests. Even though underwater sensor networks (UWSNs) share some common properties with ground sensor networks, such as the large number of nodes and limited energy, UWSNs are significantly different from the conventional ground sensor technology. First, radio communications do not work well under the water. They must be replaced by acoustic communications, which have very different travel time and characteristics. In particular, acoustic channels feature large propagation latency, low bandwidth capacity and high error rate. Second, while most ground sensors are static, underwater sensor nodes may move with water currents and other underwater activities. Due to the very different environment properties and also the unique nature of the aquatic applications, the protocols developed for ground sensor networks are not directly applicable to underwater sensor networks. Simple underwater monitoring systems have been introduced in the past. However, they are small-scale and rely on point-to-point, single channel techniques such as remote telemetry or sequential local sensing. In UWSN, the sensor nodes have a limited transmission range, and their processing and storage capabilities as well as their energy resources are also limited. Routing protocols for wireless sensor networks are responsible for maintaining the routes in the network and have to ensure reliable multi-hop communication under these conditions. In this paper, we give a survey of routing protocols for UWSN and compare their strengths and limitations.