

Multi-Sender MAC Protocol Based on Temporal Reuse in Underwater Acoustic Networks

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Abstract : Underwater acoustic networks (UANs) have become a very active research area in recent years. Compared with wireless networks, UANs are characterized by the limited bandwidth, long propagation delay and high channel dynamic in acoustic modems, which pose challenges to the design of medium access control (MAC) protocol. The characteristics severely affect network performance. In this paper, we study a MS-MAC (Multi-Sender MAC) protocol in order to improve network performance. The proposed protocol exploits temporal reuse by learning the propagation delays to neighboring nodes. A source node locally calculates the transmission schedules of its neighboring nodes and itself based on the propagation delays to avoid collisions. Performance evaluation is conducted using simulation, and confirms that the proposed protocol significantly outperforms the previous protocol in terms of throughput.

Keywords : acoustic channel, MAC, temporal reuse, UAN

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