

Distributed Network Synchronization

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Abstract:

The paper presents a non centralized, non hierarchical and distributed synchronization process for wireless mesh networks. Each node has a time base that relative to an universal clock has an offset and a clock frequency difference and the purpose of the synchronization is to correct the offset and the frequency so all the nodes will have almost the same time base. The synchronization process is based on periodically transmission of messages with timing information by the all the nodes. The timing messages can be retransmitted to other nodes. Each node is correcting his time base according to the received messages. The synchronization process has an acquisition phase when the clocks of the nodes have large variations and when the variations are reduced below a certain threshold the synchronization process switches to the tracking phase. In the tracking phase the variations among nodes are further reduced and the changes in clock parameters are followed. Synchronization algorithms and simulation results are presented.