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A Survey about Time Synchronization Mechanism in WSN

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Abstract: In this paper to take survey about time synchronization mechanism in WSN. This information is collected by a co-operative survey about time synchronization protocol in WSN. In order to understanding the synchronization mechanism in WSN. Generally they are lot of mechanism presented our today's world to achieve synchronization. This helps to you understanding better knowledge about synchronization mechanism and effective protocol used in synchronization network and it aims to achieve accuracy and scalability of the network. Nowadays sensor nodes are deployed to monitor and control variety of application and it should be used for security purpose in real time application.
Keyword: global time, RBS, GTSP, TPSN, CLOCK synchronization, global clock

I. INTRODUCTION

Sensor nodes in wireless sensor network (WSN) are equipped with cheap hardware clock that frequently drift apart due to their low end quartz crystal .In flooding time synchronization protocol(FTSP),the speed of the flood is slow because each node is wait for particular time period to propagate its time information about the reference node. Slow flooding decreases the synchronization accuracy and scalability of the network alternatively Rapid flooding which allows nodes to propagate time information as quickly possible .However rapid flooding is difficult and has several drawbacks in WSN .This paper concentrate to reduce the undesired effect of slow flooding on synchronization accuracy without changing the propagation speed of the flood. These protocols are used agreement algorithm to achieve common clock speed.
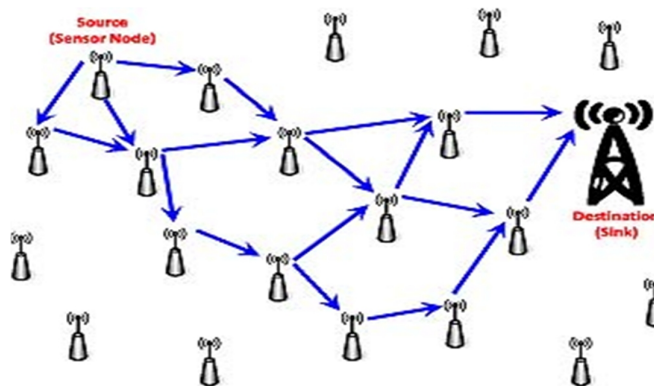
II. ARCHITECTURE OF WSN

Fig 1: Architecture of WSN

III. SYNCHRONIZATION MECHANISM

A. Flooding Time Synchronization Protocol

The FTSP is aims to achieve network wide synchronization of the local clocks of participation of node .The FTSP is effectively reduces the jitter by recording multiple time stamp both on the sender and receiver side. FTSP synchronizes the time of a sender to possible receiver utilizing a single radio message. Typically WSN operate in large global time to other nodes in a network.

1) *Slow Flooding:* This flooding mechanism transfers the time information to the network by slow. Each node waiting for a particular period to get time information from the reference node's it will increase the waiting time of a node. It will utilize the performance and scalability of a network.

2) *Fast Flooding:* This mechanism flood time information to the network as quick as possible. Because of fast flooding nodes cannot accept the time simultaneously. So the neighbor node gets colluded. Line topology will reduce this effect. But it will

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also increase the density of the network.
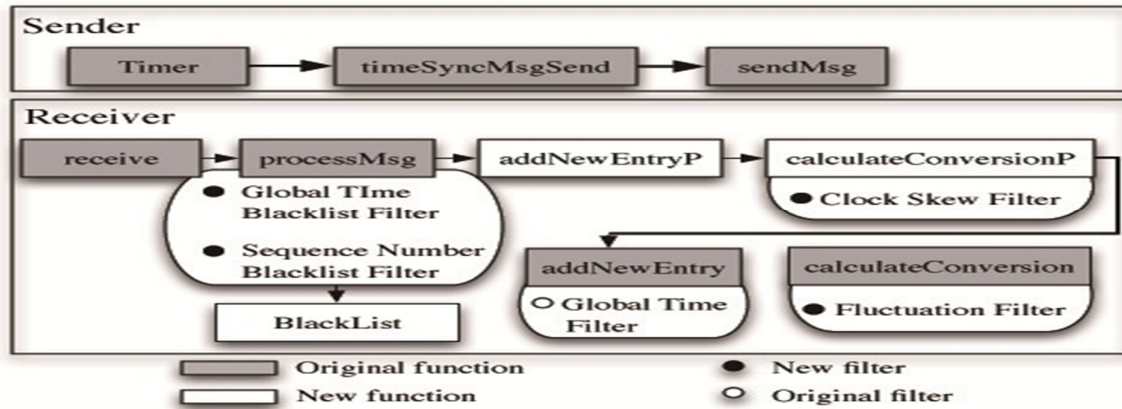
IV. ARCHITECTURE OF FTSP

Fig 3: Architecture for FTSP

A. External Time Synchronization Protocol (GTSP)

Gradient time synchronization protocol for WSN is the first and only protocol which aims at optimizing local skew in wireless sensor networks.GTSP is completely decentralized protocol since each sensor node synchronize the neighbor node and there is not any special node that act as time reference leads to inability for GTSP to provide synchronization to an external time source is required to achieve external time synchronization.
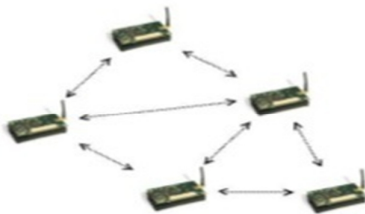
B. Light Weight Time Synchronization In WSN (LWTSP)

LTSP is not aims at high accuracy but to minimize the complexity of the synchronization. These synchronization algorithms are target minimal complexity with high precision and accept multi hop communication. Hence the idea of aggregating synchronization request is proposed when any node wishes to request synchronization, its queries adjacent node to discover to discover existence of any pending request. If any repeated, the synchronization request, decreasing the inefficiency that would be caused by two separate synchronization along the same path

V. NEED FOR TIME SYNCHRONIZATION

Fig 3: Need for Communication

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VI.   SURVEY OF EXISTING METHOD

A.   Time Synchronization Protocol in WSN (TPSN)

In the era of modern technologies, it's feasible to deploy inexpensive tiny disposable and low power device throughout the world. Sensor nodes have resource constraints in terms of storage capacity, power and processing unit. Previously WSN are deployed for military application. Nowadays using for public service like medical application, environmental monitoring, traffic control, industrial application etc.WSN sense the environment for an event and communicate to source to destination node. To identify the correct event time, these nodes must be synchronized among themselves with universal co-ordination time.

B.   Reference Broadcast Synchronization in WSN (RBS)

RBS scheme eliminates the uncertainty of source by eliminating the sender from critical path. The propagation time is negligible in networks where the range is small. This protocol helps us to improve the higher order of accuracy with greater scalability independent of sensor nodes.

C.   Flooding Time synchronization in WSN (FTSP)

FTSP especially tailored for applications of resource limited wireless platform.FTSP uses the low communication bandwidth and robust against node and link failure. The FTSP achieves its robustness by utilizing periodic flooding of time information and update dynamically. The advances in micro electro-mechanical system (MEMS) technology in digital circuits design integration and packing to smaller, cheaper and low power computing and sensing device.

VII.   CONCLUSION

This thesis focus of various time synchronization mechanism in WSN and impact of scalability of different category of routing protocols to provide QOS awareness routing support, handling resource constraints, hardware problem in a network.wsn provides ease deployment of tiny and disposable nodes and increase the performance and scalability of the network.

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