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Satellite-WSN routing Technology, DIFFERENT ROUTING PROTOCOLS IN WIRELESS SENSOR NETWORKS, use of Route DISCOVERY AND Static routing

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Abstract:-With the help of this paper we come to know Residents wear sensors equipped with accelerometers (with fall detection algorithms that detect falls with the combination of speed and orientation changes).In the case of fall detection, the sensor device beeps and an alert message is sent to the ALSP and to a designated healthcare provider. In the case of false alarm, the resident can press a button and disable the message sending from its end.

Keywords- Dynamic Source Routing, Low Energy Adaptive Clustering Hierarchy

I. Routing

Since there is no fixed topology in these networks, one of the greatest challenges is routing data from its source to the destination. Generally these routing protocols draw inspiration from two fields; WSNs and mobile ad hoc networks (MANETs). WSN routing protocols provide the required functionality but cannot handle the high frequency of topology changes. Whereas, MANET routing protocols are can deal with mobility in the network but they are designed for two way communication, which in sensor networks is often not required. Protocols designed specifically for MWSNs are almost always multihop and sometimes adaptations of existing protocols. For example, Angle-based Dynamic Source Routing (ADSR) is an adaptation of the wireless mesh network protocol Dynamic Source Routing (DSR) for MWSNs. ADSR uses location information to work out the angle between the node intending to transmit, potential forwarding nodes and the sink as shown in diagram 1. This is then used to insure that packets are always forwarded towards the sink. Also, Low Energy Adaptive Clustering Hierarchy (LEACH) protocol for WSNs has been adapted to LEACH-M (LEACH-Mobile), for MWSNs. The main issue with hierarchical protocols is that mobile nodes are prone to frequently switching between clusters, which can cause large amounts of overhead from the nodes having to regularly re-associate themselves with different cluster heads.

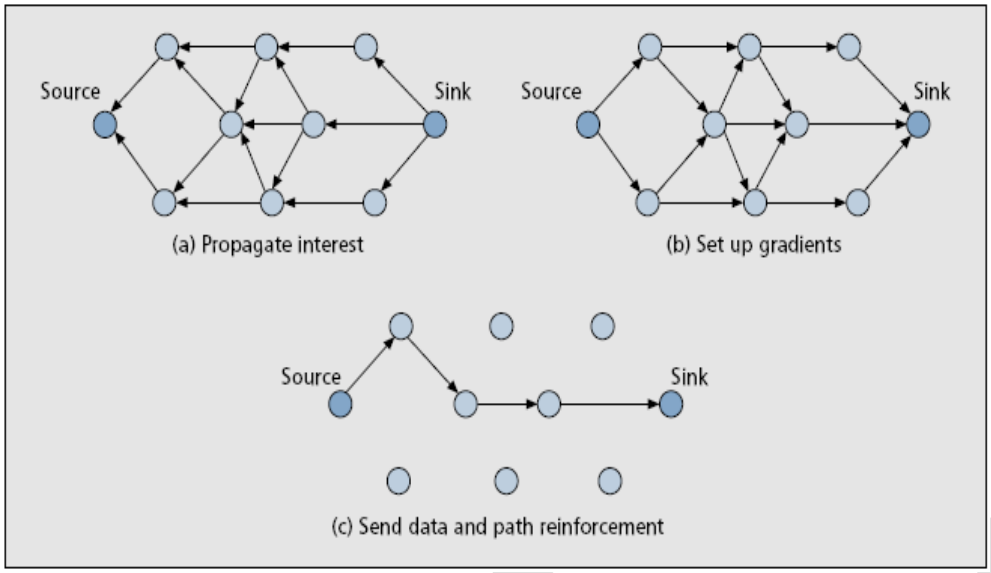

Figure1. Reinforcement and setup gradient process

Another popular routing technique is to utilize location information from a GPS module attached to the nodes. This can be seen in protocols such as Zone Based Routing (ZBR), which defines clusters geographically and uses the location information to keep nodes updated with the cluster they're in. In comparison, Geographically Opportunistic Routing (GOR) is a flat protocol that divides the network area into grids and then uses the location information to opportunistically forward data as far as possible in each hop. Multipath protocols provide a robust mechanism for routing and therefore seem like a promising direction for MWSN routing protocols. One such protocol is the query based Data Centric Braided Multipath (DCBM).

II. ROUTING PROTOCOLS IN WIRELESS SENSOR NETWORKS

The communication between the nodes of a WSN must be governed by a set of rules (protocols) in order for them to function properly as shown in diagram 2. And the data or information that they share amongst them can be tampered with by an outside intruder (adversary) for its own benefit jeopardizing the operations of the network. Thus the protocol used must provide confidentiality of the data shared among the sensor nodes in order to carry out an intended operation in the selected environment successfully.

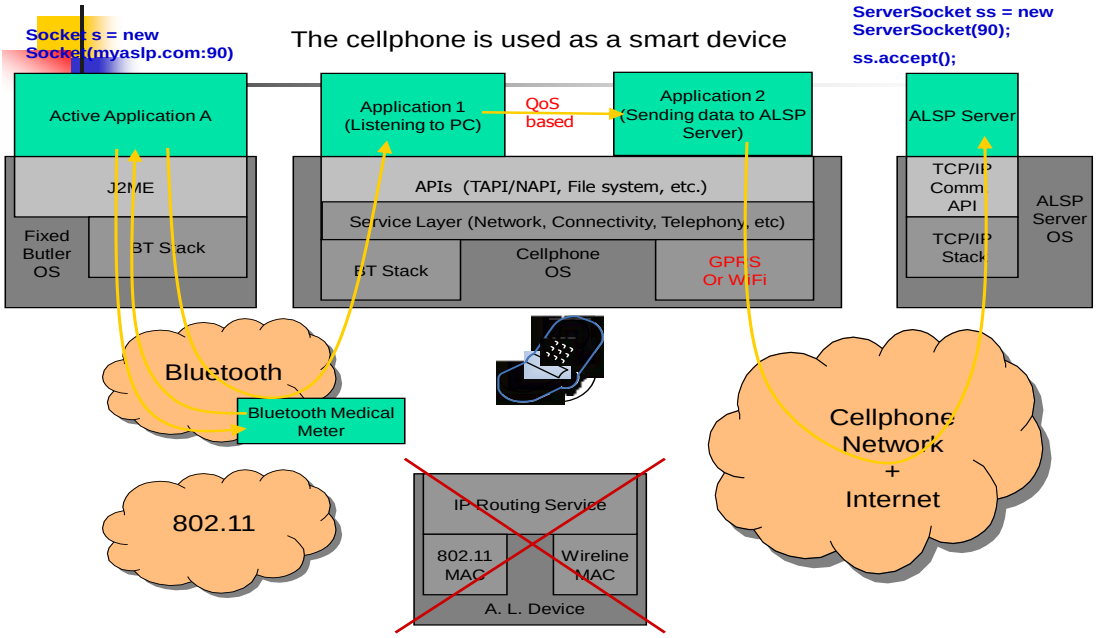

Figure2. Cell Phone used as Smart Phone.

Due to the difference of wireless sensor networks from other contemporary communication and wireless ad hoc networks routing is a very challenging task in WSNs. For the deployed sheer number of sensor nodes it is impractical to build a global scheme for them. IP-based protocols cannot be applied to these networks. All applications of sensor networks have the requirement of sending the sensed data from multiple points to a common destination called sink. Resource management is required in sensor nodes regarding transmission power, storage, and on-board energy and processing capacity. There are various routing protocols that have been proposed for routing data in wireless sensor networks due to such problems. The proposed mechanisms of routing consider the architecture and application requirements along with the characteristics of sensor nodes. There are few distinct routing protocols that are based on quality of service awareness or network flow whereas all other routing protocols can be classified as hierarchical or location based and data centric.

III. ROUTE DISCOVERY

The base station initiates the first round whenever it needs to construct the forwarding tables of all sensor nodes. This is usually in the beginning when the network is just established, or when the network may have changed substantially due to node mobility. The base station broadcasts a request message that all the sensor nodes receive, each sensor node that receives the request message for the first time in turn broadcasts a request message as shown in diagram 3. This message broadcasted by the sensor node includes a path from the base station to the particular node. When a node receives a request message for the first time, it forwards (broadcasts) this message after appending its identity in the path, it also records the identity of the sender of this message in its neighbor set. If a node receives duplicate request messages, the identity of the sender is added to its neighbor set, but the duplicate request is not rebroadcast. This serves three purposes: (1) it informs all sensor nodes that the base station is collecting topology information to build forwarding tables, (2) it aids in constructing a path from each sensor node to the base station that is used in the second round to forward feedback messages to the base station, and (3) a node receiving a request message learns that the sender of that message is its neighbor. [1]

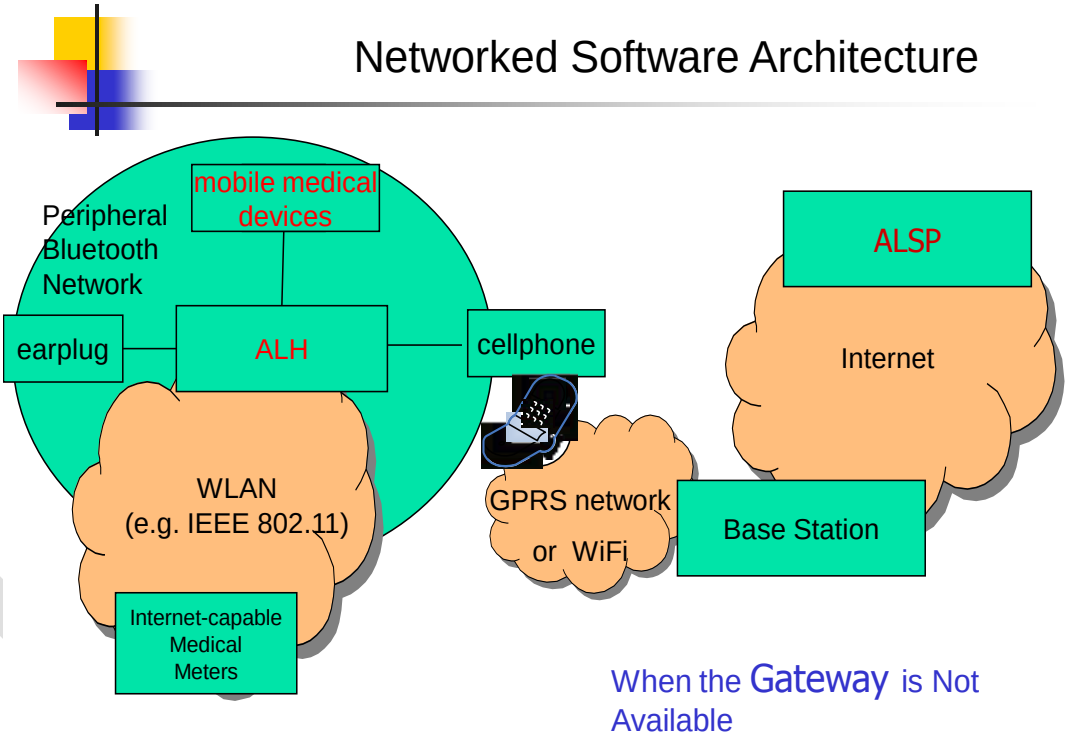

Figure3. Network software architecture

An adversary in the network can attempt to launch several attacks in this round. First, it can attempt to deceive the base station by sending a spurious request message. Second, it can include a fake path in the request message it forwards [2]. Third, it may not forward a request message, or launch a DOS attack by repeatedly sending several request messages. These attacks are counter-acted by two mechanisms: First, we leverage the concept of one-way sequences proposed by the μTESLA protocol [Perrig01] to identify a request message initiated by the base station and to restrict DOS-style flooding attacks. The base station generates a sequence of numbers $n_1, n_2, n_3, ..., n_{k-1}, n_k$, such that $n_{i+1} = F(n_i)$, where F is a one-way function, $0 < i < k$, and n_1 is chosen randomly. F is such

that it is computationally impossible to compute n_{k-1} in a limited time by knowing n_k and F. All sensor nodes are pre-configured with function F and value n_k

IV. STATIC ROUTING

Static routing is a form of routing that occurs when a router uses a manually-configured routing entry, rather than information from a dynamic routing protocol to forward traffic. Unlike dynamic routing, static routes are fixed and do not change if the network is changed or reconfigured. Static routing and dynamic routing are not mutually exclusive [3]. Both dynamic routing and static routing are usually used on a router to maximize routing efficiency and to provide backups in the event that dynamic routing information fails to be exchanged. Static routing can also be used in stub networks, or to provide a gateway of last resort. Static routing can have some potential disadvantages like In many cases, static routes are manually configured. This increases the potential for input mistakes [4]. As a result the network is unusable until the failure is repaired or the static route is manually reconfigured by an administrator [5]. Static routes typically take precedence over routes configured with a dynamic routing protocol. This means that static routes may prevent routing protocols from working as intended. A solution is to manually modify the administrative distance. Static routes must be configured on each router in the network(s). This configuration can take a long time if there are many routers [6].

V CONCLUSION

In present paper we have discussed various current tools for simulation. it produces error rate and a limitation in buffering. There is need for extra work to be done to check the heterogeneous capabilities of the network and to verify the multi-path and asymmetrical load balancing. Other future challenges includes ability to transfer data with satellite advantages with the IP stack in WSN nodes, ability to also used the satellite to change the routing mechanism using the generated IP address.

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