High Reliability Routing Protocol For Multimedia Sensor Networks

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Abstract- *Wireless multimedia sensor network design (WMSN) Routing protocol limited by traditional sensor networks Transfer based on multipath routing that is conscious of throughput energy Next Hop Selection Based Protocol (GFTEM) Hook on Demand Distance Vector Routing Protocol (AODV), Dynamic MANET On-Demand Routing Protocol (DYMO) and Greedy Boundary stateless wireless network routing (GPSR). GFTEM is responsible for the speed and simulation of sensor nodes. Efficiency compared to GPSR, AODV, and DYMO routing protocols.*

Keywords- WSN, Protocols, GFTEM, NS2, TCL

I. INTRODUCTION

Traditional sensor nodes are typically used to measure scalar physics such as temperature, pressure, humidity, and object position. However, the new version of WMSN (Wireless Multimedia Sensor Network) can send media data such as audio streams, still images, and videos. The WMSN network consists of sensor nodes with one or more sinks at the edge of the network and can be deployed indoors or outdoors. Some examples are building surveillance, factory management, livestock or wildlife surveillance and tracking. Because WMSN is a self-configuring network, the does not require a user interface to configure routing paths, power management, event collection, periodic data collection, data transmission, and more. The WMSN, on the other hand, requires a high data rate of, which is reliable, has low computing power, and needs to be portable. These are conflicting requirements that need to be optimized, resulting in quality of service (QoS) limits and shorter sensor life. Conflicting WMSN parameters are almost impossible to resolve in terms of the physical nature of the hardware components, but they provide the best balance between power consumption and QoS of the Sensor node power consumption comes from two parts: the wireless transceiver and the calculation and processing of data. Transceivers consume a lot of power from analog components such as amplifiers and analog-to-digital converters, but the data processing part consumes much less power than a digital signal processor (DSP). Based on the latter, QoS is an important metric associated with transmit delays and the correct packets received at the sink node. The WSN is extremely versatile and can be deployed to support different applications in different situations of the, whether it is a fixed sensor node or a mobile sensor node. How you use these sensors depends on the type of application. For example, in border monitoring and monitoring applications, sensor nodes are typically deployed with ad hoc to cover a specific area to be monitored. WSN has created new opportunities across the scope of human efforts, including environmental system design and manufacturing, monitoring and control, wildfire tracking, public health, battlefield monitoring, disaster management, and critical infrastructure protection. Several applications, including the collection and distribution of captured data, are presented with a flow of data from the source to the expected sink.

II. RELATEDWORK

P.C. Focus, J. Barros, M.Z. Establishing this direct connection to a Gaussian eavesdropping channel single input multiple outputs (SIMO) can provide the full characteristics of stealth capacity when eavesdroppers are distributed according to a spatial Poisson process. Our analysis, including the existence of confidentiality features and the probability of failure, reveals how eavesdropper spatial density can threaten the success of wireless physical layer security based on information theory principles.

O.O. Koyluoglu, C.E. Koksal, and H. El Gamal has shown that the RaF strategy can protect end-to-end transmissions by simply protecting individual hops. Therefore, if both hops are protected, the message is protected. This paper investigates the achievable factor of safety for each source-to- destination pair in a wireless network. First, the path loss model is considered. This assumes that legitimate and eavesdropping nodes are placed according to a strong Poisson point process. Protecting your network does not reduce the throughput per node. The reachability discussion is based on a new multi-hop transfer scheme that adds randomization to each hop to ensure maximum ambiguity to eavesdroppers. Next, consider an ergot fading model with n source and destination pairs and ne listeners. Using an ergot interference alignment scheme with proper privacy precoding, it has been shown that each user achieves a certain positive secrecy rate for a sufficiently large n.

Bell system. technology. J Wire taper suggests outputting the channel output over a discrete memoryless channel. Encoding by the sender and decoding by the receiver are acceptable. However, the codebook used in these operations is assumed to be known to wire tappers. The designer's efforts to build an encoder / decoder in this way maximize the data transmission rate R and data error D as seen by the wire tapper. Protects sensitive message information on wireless channels. The routing paths are in conflict. Full confidentiality cannot always be achieved, especially if the eavesdropper's channel state information (CSI) is not completely known.

J. Wang, P. Huang, and X. Wang has defined cross-layer resource allocation issues in a multi-user downlink environment for both instant channel information intercept scenarios and partial channel information intercept scenarios. This issue is first formulated with a new security structure. The control scheme is then envisioned to maximize the average access rate of information, taking into account delay, power, and confidentiality as constraints for both non-secret and secret interception cases in each scenario.

Charles Perkins, Elizabeth Belding Royer, and Samir Das believe that the ad hoc on-demand distance vector (AODV) algorithm enables dynamic self-starting multi-hop routing between participating mobile nodes that want to set up and maintain an ad hoc network. increase. With AODV, mobile nodes can quickly get routes to new destinations, without the node having to manage routes to destinations that are not actively communicating. The AODV enables mobile nodes to respond in a timely manner to connection interruptions and network topology changes. AODV's behavior is loop-free, avoiding Bellman Ford's infinite count problem and providing fast convergence when the ad hoc network topology changes (usually when nodes move through the network). When a link is lost, AODV sends a notification to the set of affected nodes so that the lost link can be used to invalidate the route.

III. PROPOSED SYSTEM

The main idea of the GFTEM routing protocol comes from the reliable routing and load distribution of data routing to extend the life of the network and reduce data queuing at the most used sensor nodes throughout the network. increase. Pure greedy transfer protocols have two main problems. Routes the data through the same routing path. This is usually the shortest route and is a complex process to avoid holes and find another route. Using the same routing path consumes power and shuts down some nodes, creating holes. Complex processes have high end-to-end delays. With GFTEM, multimedia streams are sent in different paths. Each forwarding node decides how to send data to its neighbors and establish a connection based on the following information:

1) GFTEM is a geo-routing protocol, where nodes are aware of geographic coordinates and adjacent nodes.
2) Distance between transfer node and destination.
3) The throughput of the forwarding node and its neighbors.
4) Residual energy level at the node.
5) The number of hops the packet visited.
6) The distance between the neighbor and the target.
7) History of forwarded packets belonging to the same stream.

A. End-to-End Delay (E2ED)

E2ED is reduced by using the multipath transmission topology. It is clear that GFTEM shows the best delay characteristics at medium density sensor nodes. This is because the paths are chosen based on the shortest path and the highest throughput neighbor node. The routing techniques of AODV and DYMO are similar, and the source must send a route request and wait for a route response message (RREP) before sending data. GPSR uses only the shortest path, but packets are stored in the buffers of neighboring nodes, so the shortest path does not necessarily have to provide the fastest routing. With GFTEM, real-time or non-delay-tolerant traffic, such as multimedia data, is given a special path to send based on the availability of the node.

B. Packet Loss Ratio

Packet loss rate PLR is another parameter that defines the performance of the WMSN routing protocol. GFTEM is superior to GPSR in medium density networks. AODV and DYMO show high packet loss rates due to the mobility of changing the location of the source node. Overall, GFTEM offers the best results in terms of delay and packet error rate compared to other protocols.

It meets the needs of multimedia data transmission, especially in time-delayed applications. The difference in packet error rates here is due to the different routing techniques used by each protocol. However, GFTEM requires a warm-up period to calculate the throughput. The default throughput is expected to be the lowest during this period. The highest throughput value obtained from the experiment does not exceed 60% of the physical layer data rate.

C. Energy Consumption

The INET framework uses it with a battery capacity of 59400J to provide a rechargeable battery module. Using energy-aware protocols will extend the life of the sensor node by the residual energy in a simple topology using GFTEM, GPSR, AODV, and DYMO. This shows that GFTEM excels in performance and energy efficiency. The GFTEM has excellent collision avoidance technology that increases energy consumption.

IV. SYSTEM DESIGN

NS2 Simulator

NS2 is an object-oriented discrete event push community simulator developed at the University of California, Berkeley and written in C ++ and OTcl. NS usually helps to simulate a network of large environments nearby. To be fair, the NS can be used cleanly once you get used to the simulator, but it's very difficult for first-time users because there isn't a clean one for manual use. There are many files written with the help of builders describing the simulator, but was basically written with the help of veterans with the help of NS customers. The motivation for this task is typically to show the simulator behave to the new customer, install the simulation community, discover the simulator code for additional community component records, and create new community components. teeth. concept. Let me come up with a easy instance and deliver a short clarification primarily based totally on our experience. This task does now no longer cowl all usages of the simulator or feasible community simulation setups; however, this task has to assist new customers get commenced proper away.

Ns2 is a discrete occasion simulator for community studies. NS2 provides basic guidance for simulating TCP, routing, and multicast protocols on loaded wireless (near and satellite) networks. See the Ns User FAQ for more records. Written in C ++, Ns2 is an item-oriented model of Tcl known as OTcl. Nam is a predominantly Tcl / TK based animation device for displaying community simulation lines and actual packet lines. This is usually intended as an accomplice animator for ns simulators.

Ns2 is a Tcl / TK primarily based totally animation device for showing community simulation lines and real packet lines. Supports topology layout, packet degree animation, and numerous information inspection tools. Nam commenced with LBL. There had been outstanding advances in current years. The improvement of the call become an ongoing collaboration with the VINT task.

The NS2 is basically an OTcl interpreter with a library of community simulation elements. When using NS, it is very helpful to see how to apply NS using OTcl. This segment contains examples of Tcl and OTcl scripts that show the basic concepts of programming in OTcl. These examples are from the 5th VINT / NS Simulation Tutorial / Workshop. Ns (from the community simulator) is a hard, fast community simulator that calls discrete events, specifically ns1, ns2, and ns3. These are all male or female community simulators commonly used in research and training. ns3 is a loose software program launched for research, improvement, and use under the GNUG PLv2 license. Community Simulator is a separate case package grade simulator. Network simulators cover a large number of applications with different types of protocols in different types of networks, consisting of different network elements and traffic models. A network simulator is a package of tools that simulate the behavior of your network. B. Creating a network topology, logging events that occur at each load, analyzing events, and understanding the network. Now, the main goal of our first experiment is to learn how to use the network simulator, become familiar with the simulated objects, and understand how the network simulation works. You also need to use network simulation to analyze the behavior of the simulation object.

Backend Environment of Network Simulator

The network simulator is mainly based on two languages. They are C ++ and OTcl. OTcl is an object-oriented version of the tool command language. A network simulator is a bank of various network and protocol objects. C ++ can help you to:

- Helps improve the efficiency of the simulation.
- Used to provide details about the protocol and its behavior.
- Used to reduce the processing time for packets and events. OTcl can help you in the following ways:
- You can write different network topologies with the help of OTcl
- Helps specify the protocol and its applications
- Enables rapid development
- Tcl is compatible with many platforms and has flexible integration
- Tcl is very easy to use and is available for free.

Protocol Description

TCP provides a communication service at an intermediate level between an application program. The software can issue a single request to TCP and let TCP handle the IP details. Working of IP is done by exchanging pieces of information called packets.

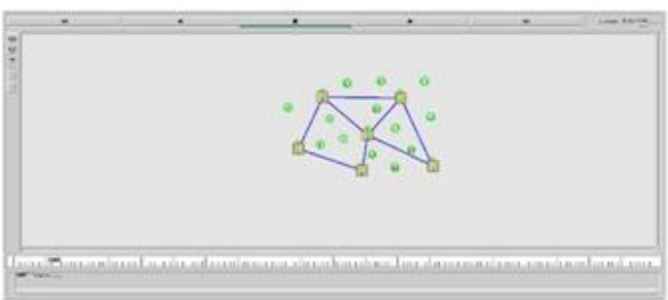
A packet is a sequence of octets (bytes) and consists of a header followed by a body. The header describes the packet's source, destination and control information. The body contains the data IP is transmitting.

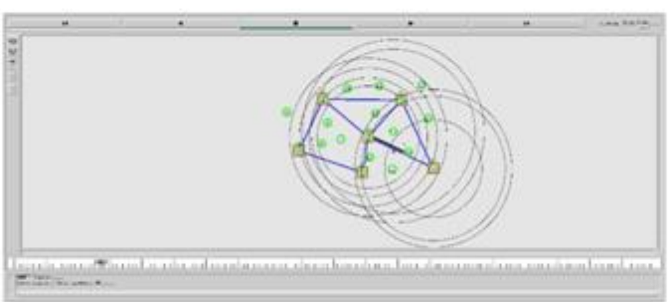
TCP detects these problems, requests retransmission of lost data, rearranges out-of-order data, and even helps minimize network congestion to reduce the occurrence of the other problems. Once the TCP receiver has reassembled the sequence of octets originally transmitted, it passes them to the receiving application. Thus, TCP abstracts the application's communication from the underlying networking details.

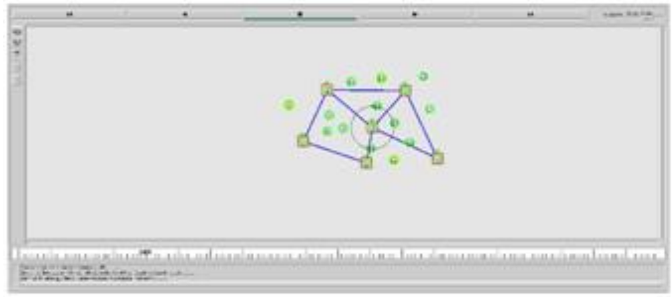
- TCP is optimized for accurate delivery rather than timely delivery, and therefore, TCP sometimes incurs relatively long delays (on the order of seconds) while waiting for out- of-order messages or retransmissions of lost messages.
- TCP is utilized extensively by many of the Internet's most popular applications, File Transfer Protocol, Secure Shell, peer-to-peer file sharing, and some streaming media applications.

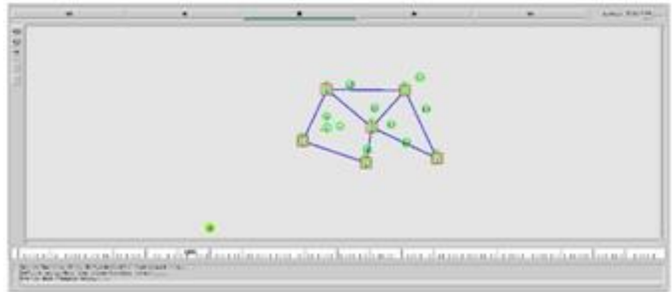
V. PERFORMANCEANALYSIS

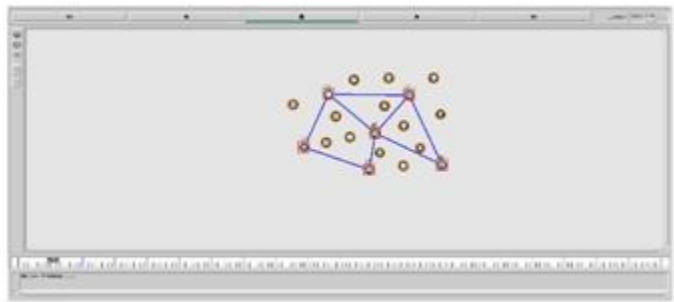
We have compared our protocol with the existing protocol i.e., GFTEM in various parameters such as End to End Delay, Packet Loss ratio and Energy Consumption. We have used X graph to show the efficiency of our model in the abovementioned aspects. The screenshots of the comparisons have been attached below.

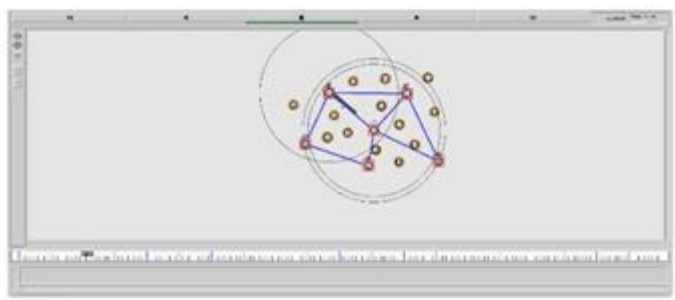


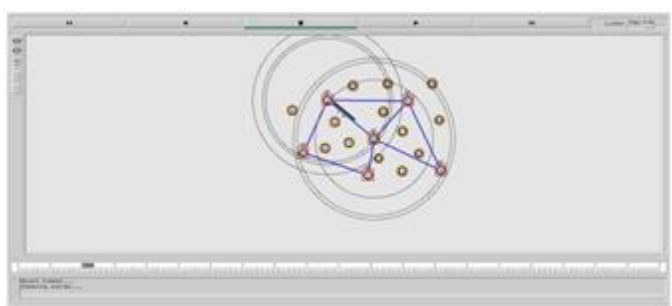


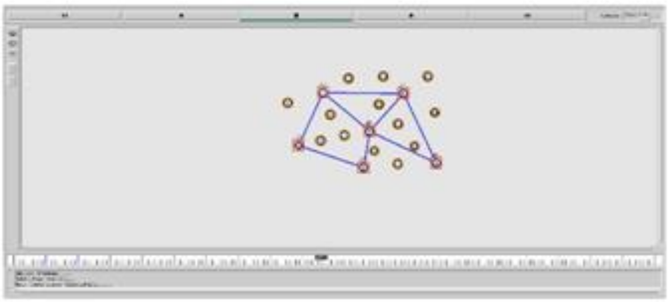


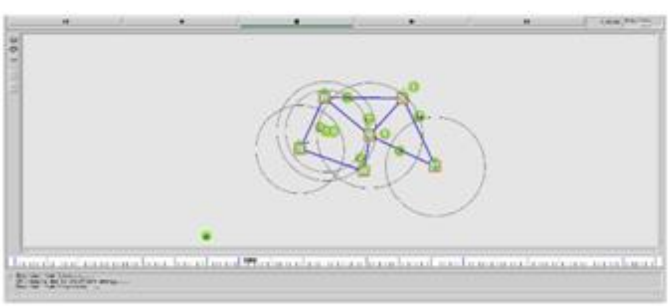


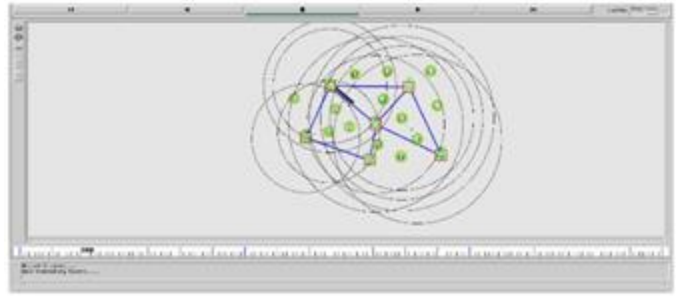


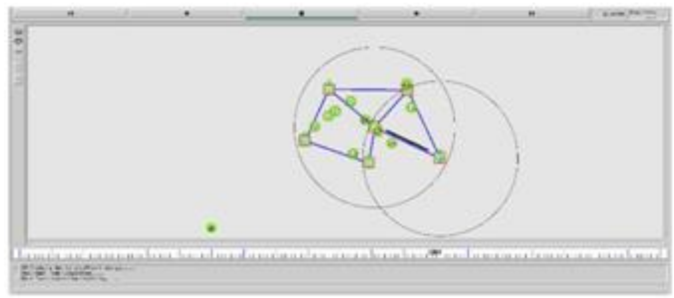


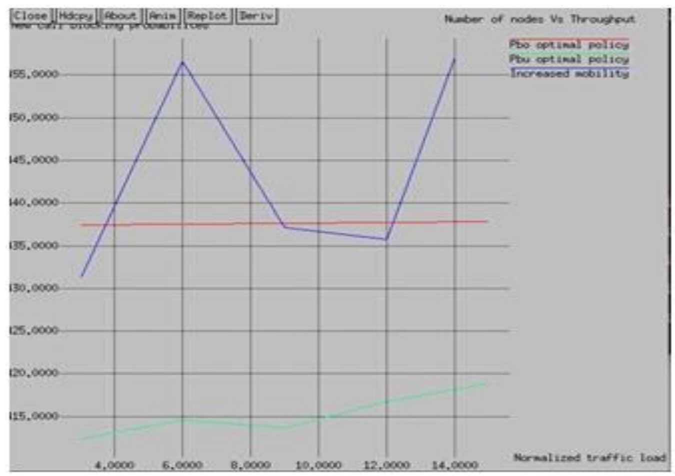




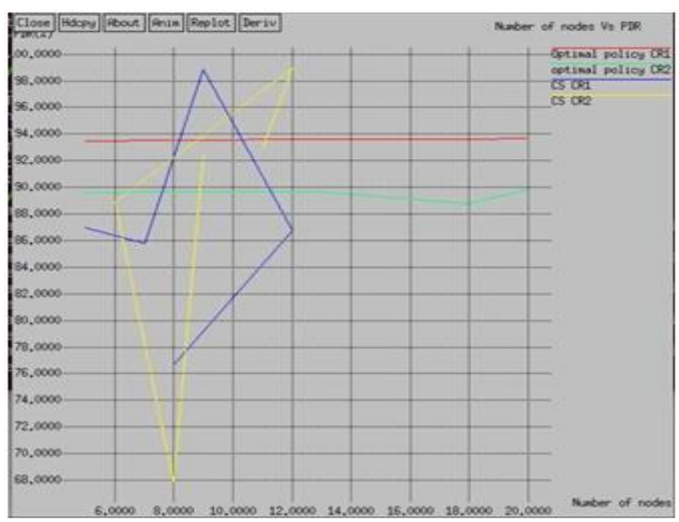


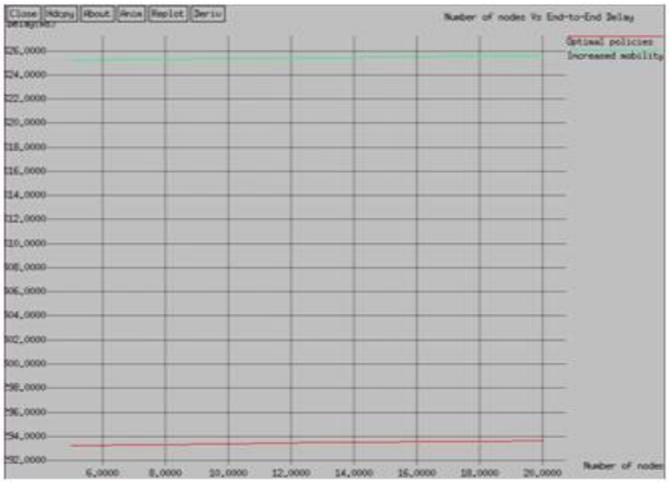






VI. CONCLUSION





VI. CONCLUSION

The Wireless Multimedia Sensor Network Design (WMSN) routing protocol is limited by the traditional Sensor Network operating protocol. These were used for scalar data such as sensor data. Smaller than multimedia data. The challenge mentioned was the motivation for designing mobile. A reliable routing protocol based on a greedy routing structure. This article proposes Greedy' s new routing protocol. Transmission based on multipath routing to detect throughput energy Next Hop Selection Based Protocol (GFTEM)Node has the highest throughput and the destination node is the closest. GFTEM performance is displayed and compared to the Ad hoc Demand Distance Vector Routing Protocol (AODV), Dynamic MANET On-Demand Routing Protocol (DYMO), and Greedy Boundary Stateless Wireless Network Routing (GPSR) indicators. Alternatively, use the OMNET ++ Simulator, logs to see the end-to-end delay, packet error rate, and residual energy. The protocol has been tested under various conditions. The GFTEM is responsible for the speed and simulation of the sensor nodes. The higher the energy, the better the end-to-end delay and packet loss rate compared to GPSR, AODV, and DYMO routing protocols.

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