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Energy Conservation and Effective Data Transmission Using the Selective Data Dissemination Strategies

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ABSTRACT
The data transfer from source to destination is a concern in a MANET. The Mobile Ad-Hoc networking provides the user to access and transfer the information on the go. As more and more users come into contact with MANET, the security will be at stakes. The security will be prime objective when MANET is utilized. The source will transfer the data toward the destination with the help of sensors. The energy consumption has to be minimized since the sensors have limited energy associated with it. In the proposed system we will make sure that same packet cannot be transferred again and again toward the destination. BAM method will be utilized for this purpose. The Buffer allocation method will store the packet to be transferred within the buffer and then transferred the packet. The next packet to be transferred will be compared with the previous packet stored within the buffer. If the packet matches then new packet will be rejected.

Keywords:- MANET, BAM, Energy, Sensors, Packet, Buffer

I. INTRODUCTION

The data transfer from source to the destination will always be the concern when mobile ad-hoc network is consider. (1) Various routing protocols are suggested in order to indicate the flow of data through the MANET. Primarily the data transfer process consist of Reactive, proactive and hybrid protocols. The reactive protocols are those which will take into account both path and traffic. Proactive protocols are those which consider only the path but not the traffic. Hybrid protocols on the other hand consider all the aspects which are present within reactive and proactive protocols.

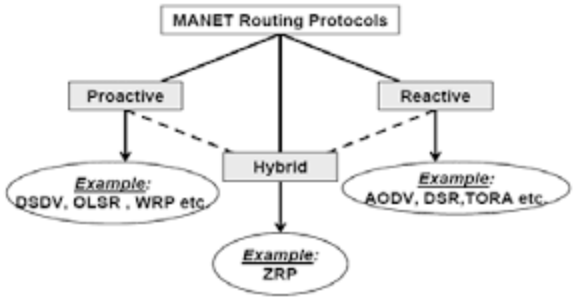


Fig 1: Showing different types of MANET routing protocols.

As more and more users try to access and use MANET, security will be at stakes. In order to overcome the problem number of security mechanisms are suggested. (2) Concept of network security will be considered in this case. The network security in this case is achieved with the help of cryptography. Plain text is provided in this case to the encoder. The encoder receives this text and converts it into the cipher text.

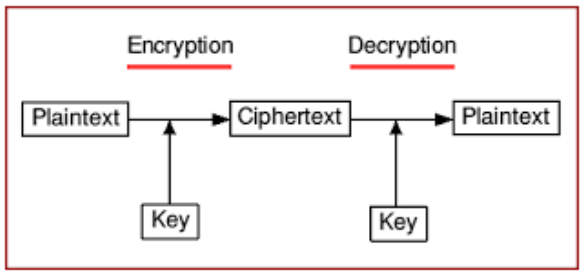


Fig 2: Showing the Security mechanism used in MANET

The security mechanism like cryptography is widely used within the MANET in order to ensure that data is securely delivered to the destination without the interference of the intruder. In addition to the security energy conservation of the sensors is also very important. The energy conservation is required since sensors have limited energy associated with them. (3) In order to conserve energy location specific routing will be utilized. The mechanism suggested in this paper takes into consideration the path which is efficient in order to

transfer the data will be selected for transmission purpose. The results have shown that energy conservations will increase by 20%.

When data is to be accesses from the MANET then efficiency factor also considers important application. (4) Caching is a common technique to improve efficiency of data access in MANETs (Mobile Ad hoc Networks), where users communicate using small portable devices connected by resource constraint wireless networks. In some MANET applications, controlling/reducing the cache locations are desirable due to security issues, restricted shared memory and maintenance cost. However, reducing the number of caches should be done by finding optimized cache locations (at highly connected and centrally located nodes) so that it does not affect the performance efficacy of data access in terms of response time. Existing cooperative caching approaches are deficient in finding such optimized cache locations as they do not focus on reducing the number of copies by finding their optimized locations to be shared among nodes.(5) In this paper, we design and evaluate such a caching scheme using a single broker based MANET architecture to improve data access latency. Our scheme reduces the number of caches by efficiently placing them at locations which brings distant data closer to the source. The performance comparison of our scheme with one such recent caching scheme showcases improvement in data access efficiency by 30% along with reduction in number of cache locations by 72%.

II. EFFICIENT ROUTING APPROCHES FOR MANET

There exists legion of routing protocols used in MANET. The routing protocols are divided into number of categories.

1) Static routing
2) Dynamic routing

Static routing considers the data transfer process as in constrained environment where traffic will never be a problem. (6) Static routing will be useful in a environment where perfect supra system is considered. The static routing is better in a situation where fast delivery from source to the destination is required.

Dynamic routing on the other hand will consider both the shortest path as well as the traffic present over the network. The traffic will give the packet narrow path to pass to the destination and hence cause the propagation delay.(7) This paper proves that dynamic routing is better as compared to static routing since traffic is also considered as a metric in the process of transmission of data.

III. PROPOSED WORK

The proposed work deals with removing redundancy and then selecting optimum path for data transmission. The mechanism suggested here is known as selective data dissemination with path recognition. The proposed method utilize the concept of buffer management in order to remove the redundancy and then using the path recognition mechanism in order to select the effective path from source to the destination. The proposed system is divided into following parts.

IV. PROPOSED METHODOLOGY

The proposed method will involve flowchart and algorithms describing the working of the proposed system. The buffer and data transfer mechanism are described using the proposed technique. The buffer mechanism will be useful in a environment where redundancy exist. The malicious environment will cause such a situation. The proposed mechanism will deal with the security issue by eliminating the duplicate packet from the packets being transferred. (8) Ad-hoc networks have lots of challenges than traditional networks. It has challenges like infrastructure less and self organizing networks. They don't have any fixed infrastructure. In MANET there will be no centralized authority to manage the network.(9) Nodes have to rely on other nodes to keep the network connected. As the ad-hoc network is dynamic and every transmission in these networks become vulnerable to many number of attacks and security becomes a major issue. In this paper we study the Redundancy attacks to ad-hoc networks and also discussed available solution. We try to provide a brief introduction to the types of attack and possible counter measures to prevent the attack. (10) The routing protocols will play important role in the proposed technique. The technique which is used in this case will consist of range based mechanism. The range methods utilize the overlapping algorithm in order to determine the range of the

sensors. If the range intersect then it is possible to transfer the data toward that sensor.

Square of (d) < (r1 + r2)*(r1+r2)

(11)this formula suggest the radius overlapping mechanism which is utilized in the proposed system. This mechanism is used to detect the path from source to the destination. When selective data is transmitted from source to destination then power is saved and efficiency is in increased. Duplicate packets are not transmitted. In our Project we have considered a storage capacity with each sensor nodes. When data is stored in the buffer of Nodes then that data will not be deleted until it is transmitted successfully to the destination. Which means the sender does not have to be invoked again if the packet is lost. The data can only be transmitted if there exist a path. In order to determine the path we have checked the centers and radius of the signal which is generated by the sensor node.

The flowchart will be listed as follows

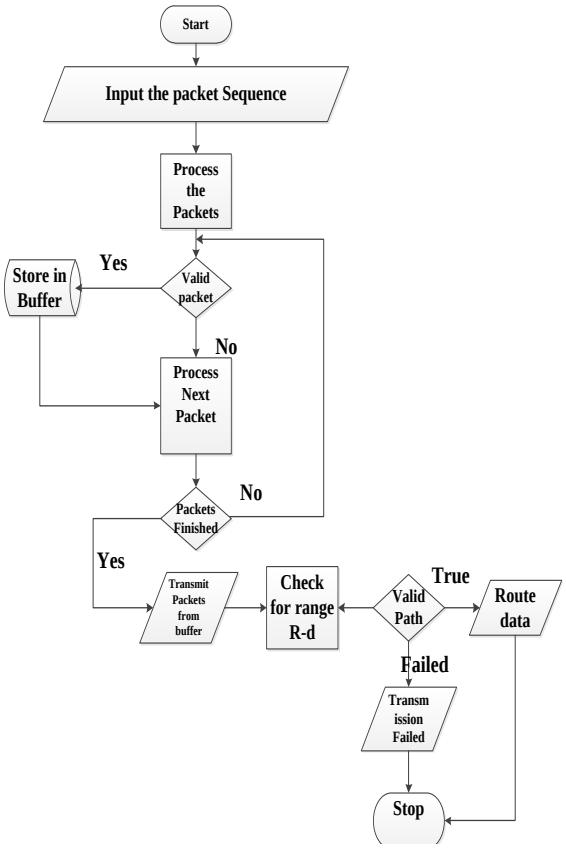


Fig 3: Showing the flowchart of the Buffer Method to reject and accept the packets and then selecting the range for selective path management

The proposed flowchart describe packet sequence is received and then processing is applied on it. After processing the elements valid packets are stored within the buffer and extra packets are neglected. The proposed System Pseudo code will be as follows

SDT with Path Management

1. Receive the data in the form of packets with different or same sequence numbers (e.g. 1,2,3,4,1,2,3 etc)
2. After Receiving the packets store them in buffer.
3. Buffer will be divided into slots(b1,b2-----,bn)
4. When one packet is stored within the buffer then its sequence number can be compared against incoming packet sequence number.
5. If the sequence number is same then the incoming packet will not be moved forward and system will go into sleep mode.
6. Otherwise packet will be accepted.
7. After receiving the packets nodes will be analyzed along with the path.
8. If there is interference or node is down then sensor will detect some other path using Range based Algorithm.
9. Interference will be detected using Sphere Intersect Algorithm.
10. By following the above mechanism overall reliability, power management and efficiency will be increased.

The proposed systemis divided into two categories. First we will describe the SDT algorithm and then we will use path management mechanism to transfer the data.

SDT (A, B)

Returns (Non-Redundant, Redundant)

1. Input Packet Sequence (p1,p2,----------,pn)
2. Initialize k=1
3. Store the packets in Buffer slots (b1,b2,----------bn)
4. Repeat the steps for i<=n
   a) Repeat the steps for j<=n

a1) if (pi=bi) then

a1.1) k=2

End of if

a2) j=j+1

End of Inner loop

b) if(k=1)

c) b1) return Redundant

Else

b2) return non-Redundant

End of if

c) i = i+1, k=1

End of outer loop

The above algorithm will use the buffer in order to store the packets which are compared against the new packet to remove the redundancy. The above algorithm specifies the mechanism to transfer the data without redundancy.

The range detection algorithm is also used to determine the path within the MANET.

Sphere intersect (A, B)
Returns (OVERLAP, DISJOINT)

1. l = c2 − c1
2. Square of (d) = l.l
3. if (square of(d) < (r1 + r2)*(r1+r2))
4. return (OVERLAP);
5. Else
6. return (DISJOINT);

If the interference is high then the signals do not intersect with each other and data will not be moved forward. Signals from two distinct sensors will intersect with each other only if distance between there centers c1 and c2 is less then sum of their radii r1 and r2. If the interference is present then either separate path will be followed to transmit the data.

V. RESULTS

The result of the proposed technique is better as compared to the existing approach which is proved with the help of the simulation carried in Net beans 8.0.

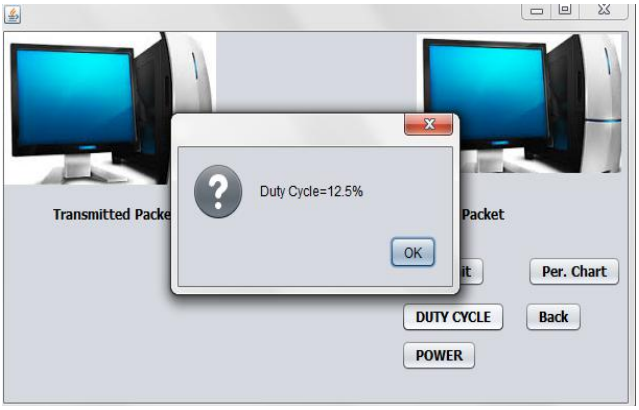


Fig 4: The duty cycle of the existing system

The duty cycle describe the uptime for the sensor. More the duty cycle more will be the efficiency.

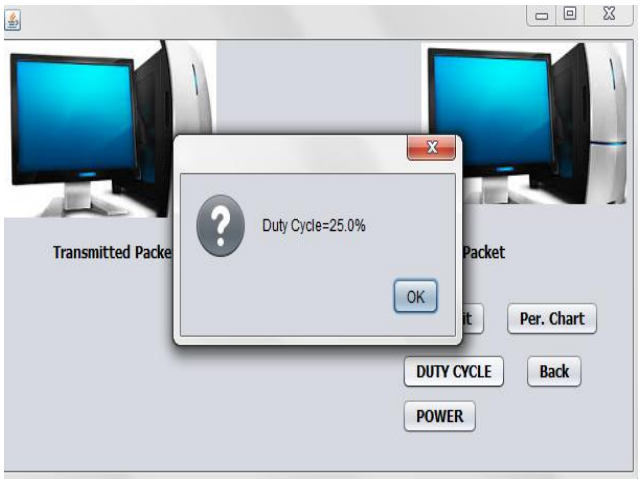
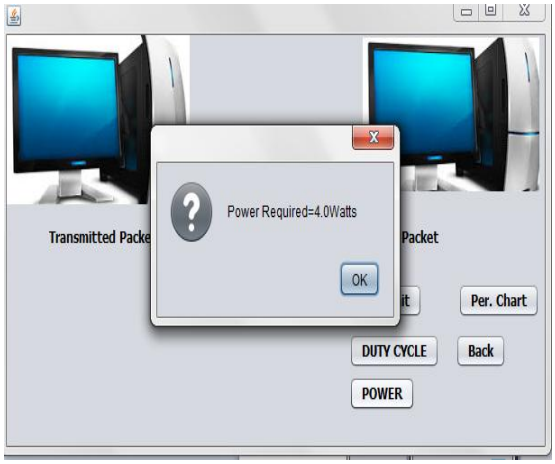


Fig 5: Showing the duty cycle of the proposed system

The power consumption of the proposed system is less as compared to the old system.



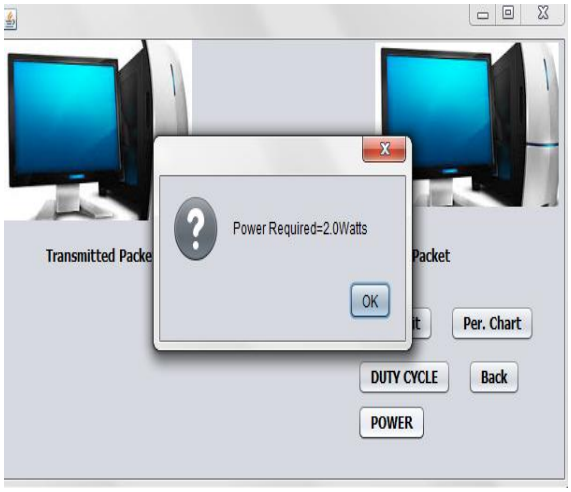


Fig 6: Showing power consumption of the existing and proposed system.

From the above it is clear that power consumption is minimum in case of the proposed system.

VI. CONCLUSION AND FUTURE WORK

The scheme proposed in the paper addresses to all the power efficiency related problems that a WSN faces today. Reduction of power consumption has always been a major factor in designing any network model as this ensures efficient operation of the network at low operation costs. The proposed ad-hoc network reduces power consumption contrary to the conventional wireless network. The protocol itself is designed suck that the decisions are implemented without wasting much of power. Sensors and switching logics are optimized to run on low power.

This said there remains much to be done to reduce the power consumption thereby increasing the efficiency of the network. Any network needs a long lasting power source for operation. The still remains a great deal to de improved in this area. Power sources can be re-designed to last longer. Smart wireless sensors can be implemented that can take switching decisions themselves. This would reduce the transfer cost of data from centralized network to nodes thus reducing power consumption. The protocol can be enhanced to increase power efficiency.

In our algorithm we will use the concept of signal strength. If strength of the signal is high then that path will be selected because of this there is less chances of data loss. The data when deliver to the destination acknowledgment will be generated. Since there is less number of passes hence, less time will be consumed for data transmission.

The still remains a great deal to be improved in this area. Power sources can be re-designed to last longer. Smart wireless sensors can be implemented that can take switching decisions themselves. This would reduce the transfer cost of data from centralized network to nodes thus reducing power consumption. The protocol can be enhanced too to increase power efficiency.

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