



ISSN(Online): 2320-9801
ISSN (Print): 2320-9798

International Journal of Innovative Research in Computer and Communication Engineering

(An ISO 3297: 2007 Certified Organization)

Website: www.ijircce.com

Vol. 5, Issue 1, January 2017

Review on Cluster Based Energy Efficient and Reliable Routing Protocol

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ABSTRACT: To address the problem of energy efficient reliable routing in wireless networks in the presence of unreliable communication links or devices or lossy wireless link layers by integrating the power control techniques into the energy efficient routing. This work deals with the problem of energy-efficient reliable wireless communication in the presence of unreliable or loss wireless link layers in multi-hop wireless networks. Energy-Efficient and Reliable Routing (E2R2) is proposed for networks in which either hop-by-hop or end-to-end retransmissions ensure reliability. In wireless sensor networks, due to unreliable wireless media, host mobility and lack of infrastructure, providing secure communications is a big challenge in this type of network environment. In present work to ensure the security in unreliable wireless communication the cluster based topology scheme is used, to obtain confidentiality and authentication of nodes hash function and MAC (Message Authentication Code) techniques are used.

KEYWORDS: E2R2,MAC etc

I. INTRODUCTION

The MANET (mobile-ad hoc) is one type of network routing protocol for increasing energy efficiency. In any networks, the energy efficiency is an important design concern because it reduces energy efficiency in packet routing or forwarding. The another category includes algorithms for finding energy efficiency routing but it has having major drawback, it doesn't consider the accrual energy consumption. The third algorithm category try to extend the lifetime of the network. They find the routes consisting the nodes with high level of battery energy.

II. RELATED WORK

G. Kalpana [1] This paper, WSN have gained wide popularity and have increased tremendously in recent time due to growth in Micro-Electro-Mechanical Systems (MEMS) technology. WSN has to connect the physical world with the virtual world by forming a network of sensor nodes. In cluster-based routing, special nodes called cluster heads form a wireless backbone to the sink which collect data from sensor and forward it to sink. Energy saving in these approaches can be obtained by cluster formation, cluster-head election, data aggregation at the cluster-head nodes to reduce data redundancy and thus save energy. One of the main challenges in the design of routing protocols for WSNs is energy efficiency due to the scarce energy resources of sensors.

Therefore, routing protocols designed for WSNs should be as energy efficient as possible to prolong the lifetime of individual sensors, and hence the network lifetime. We have surveyed a routing protocols and we got Spatial queries and databases using distributed sensor nodes and interacting with the location-based routing protocol are open issues for further research. Future research issues should focus on security, QoS and node mobility. Routing techniques for WSNs should address application-dependent security issues such as reliability, authentication, confidentiality etc. and examined.

Mohammad Masdari [2] In this paper, Multipath routing protocols improve the load balancing and quality of service in WSN and also provide reliable communication. This investigates various multi-path routing protocols of the WSN in the literature and illustrates its benefits. The main elements of these schemes and their classifications based on their



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attributes have been also discussed. Multipath routing is one of the effective methods to improve the capacity of network and productivity of sources under heavy traffic conditions. It presented a comprehensive analysis of multipath routing protocols in wireless sensor networks. The researchers also specified the challenges related to designing multipath routing protocols in WSN and compared various properties of these routing protocols. The mentioned comparison is of great importance to understand the existing solutions and also design new multipath routing protocols. K. Vinoth Kumar [3] This paper work aims at designing a multichip energy efficient, reliable and fault tolerant routing protocol. It proposes to maintain an asymmetric network of sensors so that the nodes get a chance to configure their transmission ranges best, and thus delivers data to the base station. Our protocol design concentrates on the load sharing feature by maintaining multiple routes and selecting the best one for relaying the data packets. The problem of bottleneck around the base station is addressed by varying the transmission ranges of the nodes periodically, which changes the topology, to balance the responsibility among the nodes across the network. The effort was directed towards uniform distribution of data transmission and dissemination load among the nodes across the network. We studied the specification of MICAz motes and came to conclusion that by per-node transmission power adjustment, it is possible to control topology and thus eliminate the bottleneck around the base station. It resulted in increase in the lifetime of the network.

Ning Sun [4] In this paper, Energy awareness is used to design a routing protocol for wireless sensor networks (WSNs) due to the capability limitation of the nodes. Reliability has an important issue in WSNs, since the nodes are prone to failure and the networks are unstable. The proposed Energy Efficient and Reliable Routing Protocol (E2R2P) uses clustering hierarchical structure to efficiently decrease the amount of data transmissions between nodes and the base station (BS). Furthermore, our protocol allows cluster heads (CHs) transmit data to the BS along multiple disjoint paths, so as to improve the transmission reliability even if some paths are in failure, in the same time reduce the energy consumption of the whole network. E2R2P uses distribute probability algorithm to group network into clusters, which reduces the number of messages that need to be delivered in the network.

Furthermore, algorithms of cluster head rotation and multipath discovery are employed to evenly distribute energy consumption among all the nodes. Both of the process of cluster formation and multiple path discovery are in distributed manner, it guarantees the scalability of the network. The methods in turn result in load balance and fault tolerance, finally prolong network lifetime.

Ali Norouzi [5] In this paper, WSNs are employed in several applications, energy usage is the determining factor in the performance of wireless sensor networks. Consequently, methods of data routing and transferring to the base station are very important because the sensor nodes run on battery power and the energy available for sensors is limited. We intend to propose a new protocol called Fair Efficient Location-based Gossiping (FELGossip-ing) to address the problems of Gossiping and its extensions. Saving the nodes energy leads to an increase in the node life in the network, in comparison with the other protocols. Furthermore, the protocol reduces propagation delay and loss of packets. Hence we studied the operation of a Gossiping routing protocol with safe energy consumption, and discussed the factors of energy optimization.

And we find the ways in which we choose the next hop, the network lifetime can be extended. As a result, we have extended the network lifetime, a high packet delivery ratio, reduced the message overheads and the energy consumed by the nodes. In Green Wireless Networks we propose a new routing protocol that optimizes energy consumption and bandwidth. Using less energy in routing protocols reduce nature pests.

Satvir Singh [6] In this paper, An energy efficient routing is a significant issue in the designing of Wireless Sensor Network (WSN) protocols. It presents a comprehensive survey on energy efficient routing protocols in WSNs. From the protocols, it is clearly seen so far that, the performance of protocols is worth promising in terms of energy efficiency. There is very little research done in improving QoS parameters in a very energy constrained sensor networks. The sink node and sensor node are mostly stationary thus research can be done by assuming sink and source node as mobile Various topologies, routing algorithms can be used based on the different application of WSN. Results can be improved using multiple sink nodes.

Monica R Mundarda [7] In this paper, WSN consists of low cost, low power, small in size and multi-functional sensor nodes. Routing protocols in WSNs emphasize on data dissemination, limited battery power and bandwidth constraints in order to facilitate efficient working of the network, thereby increasing the lifetime of the network. WSN has a design trade-off between energy and communication overhead which forms the nerve center of the routing techniques. we present a survey of state-of-the-art routing techniques in WSNs under all the three categories. We epitomize these



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routing techniques and bring out the advantages and disadvantages followed by their application domain. We classify the routing protocols in WSNs into datacentric, hierarchical and location based depending on the network structure. Data-centric protocols use the metadata structure to transmit the sensed information to the BS. Naming the data helps to construct a query which requests for only certain attributes of the data, thus known as data-centric routing techniques. Hierarchical routing protocols adopt the clustering approach by grouping sensor nodes. This approach is highly scalable and thus used in a number of applications.

Location based protocols use the information of position of sensor nodes intelligently to route data. We epitomize the logic behind these protocols followed by the advantages and constraints. We also mention the possible application domain of these protocols and scope for improvement in the future.

Ahmed Ali Sai hood [8] Designing energy efficient and reliable routing protocols for mobility centric applications of wireless sensor network (WSN) such as wildlife monitoring, battlefield surveillance and health monitoring is a great challenge since topology of the network changes frequently. Existing cluster-based mobile routing protocols such as LFPMWSN, LEACH-Mobile, LEACH-Mobile Enhanced and CBR-Mobile consider only the energy efficiency of the sensor nodes. However, reliability of routing protocols by incorporating fault tolerance scheme is significantly important to identify the failure of data link and sensor nodes and recover the transmission path. The protocols allocate extra timeslots using time division multiple access (TDMA) scheme to accommodate nodes that enter a cluster because of mobility and thus, increases end-to-end delay. Enhanced the existing LFPM-MWSN to ELFCP-MWSN in which we reduce network energy consumptions and slightly less end-to-end data transmission delay than the existing LFPM-MWSN. ELFCP-MWSN also incorporates a simple range free approach to localize sensor nodes during cluster formation and every time a sensor moves into another cluster. ELFCP-MWSN protocol is more efficient in terms of energy consumptions, have less end-to-end network delay, Packet Delivery Ratio is higher than those of the existing LFPM-MWSN protocol.

III. METHODOLOGY

A) Node Creation Phase

Node is created in this phase. This phase is used to create the node region. Each region includes five region in it. we can select the source node and destination node from the regions.

B) Gathering information about Nodes

After the node creation done, in this phase source and destination nodes are selected, then they ready for transmission of the message. the message get passed through the nodes having highest energy level in it.

C) Find Reliable Routes

Here we proposed Energy-Efficient and Reliable Routing (E2R2). It does end to end (E2E) retransmission which provides reliability. It considers the number of transmission attempts on the energy cost of routes and impact of acknowledgement of packets on energy cost of routes.

closer to practical implementations our objective is to find reliable routes which minimize the energy cost for E2E packet traversal.

D) Minimum Energy Cost Routing

The key point is that energy cost of a route is related to its reliability. In Energy-Efficient and Reliable Routing, energy cost of a path for E2E packet traversal is the expected amount of energy consumed by all nodes to transfer the packet to the destination. In Energy-Efficient and Reliable Routing (E2R2), the energy cost of a path is the expected battery cost of nodes along the path to transfer a packet from the source to the destination.

E) Increase the Operational Lifetime of the Network

The operational lifetime of network considers the energy consumption and the remaining battery energy of nodes as well as quality of links to find energy-efficient and reliable routes that increase the operational lifetime of the network.. Simulation studies show that Energy-Efficient and Reliable Routing (E2R2) is able to find energy-efficient and reliable routes and extends the operational lifetime of nodes.



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IV. ANALYSIS

Thus we have studied the different routing protocol and related work with them. we studied the methodology of Energy Efficient and Reliable Routing Protocol and the way to implement it.

V. CONCLUSION AND FUTURE WORK

We studied E2R2 which can increase the operational lifetime of network. It uses energy-efficient and reliable routes for it. The E2R2 also improve the lifetime of the nodes. They direct the traffic through the node which having high amount of battery energy.

In case of node failure , the system use the alogorithm,by which packet routing is done and problem was overcome.but in future the next model will be for the recovery of the node by which the fail node can recover itself without selecting an alternate path.

REFERENCES

1. G.Kalpna, Dr.T.Bhuvanewari, "A Survey on Energy Efficient Routing Protocols for Wireless Sensor Networks", 2nd National Conference on Information and Communication Technology (NCICT) 2011.
2. Mohammad Masdari1 and Maryam Tanabi2, "Multipath Routing protocols in Wireless Sensor Networks: A Survey and Analysis", International Journal of Future Generation Communication and Networking Vol.6, No.6 (2013), pp.181-192.
3. K. Vinoth Kumar1, S.Karthikeyan2, " Multihop Energy Efficient Reliable and Fault Tolerant Routing Protocol for Wireless Sensor Networks", ISSN 2250-2459, ISO 9001:2008 Certified Journal, Volume 3, Issue 2, February 2013.
4. Ning Sun, Young-bok Cho, Sang-ho Lee, "A Distributed Energy Efficient and Reliable Routing Protocol for Wireless Sensor Networks", IEEE International Conference on Computational Science and Engineering IEEE International Conference on Computational Science and Engineering CSE/I-SPAN 2011.
5. Ali Norouzi1, Faezeh Sadat Babamir2, Abdul Halim Zaim3, "A Novel Energy Efficient Routing Protocol in Wireless Sensor Networks", IEEE 2011.
6. Satvir Singh, Meenaxi, "A Survey on Energy Efficient Routing in Wireless Sensor Networks", IEEE Volume 3, Issue 7, July 2013.
7. Monica R Mundada1, Savan Kiran1 , Shivanand Khobanna1, Raja Nahusha Varsha1 and Seira Ann George1, "A STUDY ON ENERGY EFFICIENT ROUTING PROTOCOLS IN WIRELESS SENSOR NETWORKS", International Journal of Distributed and Parallel Systems (IJDPS) Vol.3, No.3, May 2012.
8. Ahmed Ali Saihood, Rakesh Kumar, "Enhanced Location Based Energy-Efficient Reliable Routing Protocol for Wireless Sensor Networks", International Journal of Inventive Engineering and Sciences (IJIES) ISSN: 2319-9598, Volume-1, Issue-6, May 2013.
9. Neha Rathi1, Jyoti Saraswat2 and ParthaPratim Bhattacharya3 , "A REVIEW ON ROUTING PROTOCOLS FOR APPLICATION IN WIRELESS SENSOR NETWORKS", International Journal of Distributed and Parallel Systems (IJDPS) Vol.3, No.5, September 2012.

BIOGRAPHY

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