Middle-East Journal of Scientific Research 20 (1): 34-37, 2014
ISSN 1990-9233

DOI: 10.5829/idosi.mejsr.2014.20.01.11268

Implementing of an Enhanced Transmission in Minimum Energy with Cooperative Networks

K. Rajakumari

Department of Computer Science and Engineering,
Bharath University,Tamilnadu, India

Abstract: In cooperative networks, transmitting and receiving nodes recruit neighboring nodes to assist in communication. A cooperative communication protocol is proposed for the establishment of clusters and for cooperative transmission of data. The sender nodes can use larger transmission power for the same probability of bit error, thus increasing the energy consumption. This allows the sensor to use more energy. The transmission that maximizes the energy consumption and decreases the transmission reliability and therefore the reduction in error rate and the energy savings translate into increased lifetime of cooperative sensor networks.

Key words: Clustering · Cooperative Networks Energy · Efficient protocols · Cooperative Transmissions · Sensor Networks

INTRODUCTION

In Wireless sensor networks, nodes have limited energy resources and, consequently, protocols designed for sensor networks should be energy-efficient. One recent technology that allows energy saving is cooperative transmission. In cooperative [1-5]. Transmission, multiple nodes simultaneously receive, decode and retransmit data packets.

Related Works: *Cooperative* communication is an active area of research today [6-10]. It enables nodes to achieve spatial diversity, thereby achieving tremendous improvement in system capacity and delay. Due to its immense potential, extensive investigations have been directed to closely examine its performance by means of both analysis and simulation [11-12]. However, the study of this new technology in an implementation-based system is very limited. In this paper, we present two implementation approaches to demonstrate the viability of realizing cooperation at the MAC layer in a real environment. The paper describes the technical challenges encountered in each of the approaches, details the corresponding solution proposed and compares the limitations and benefits of the two approaches [13].

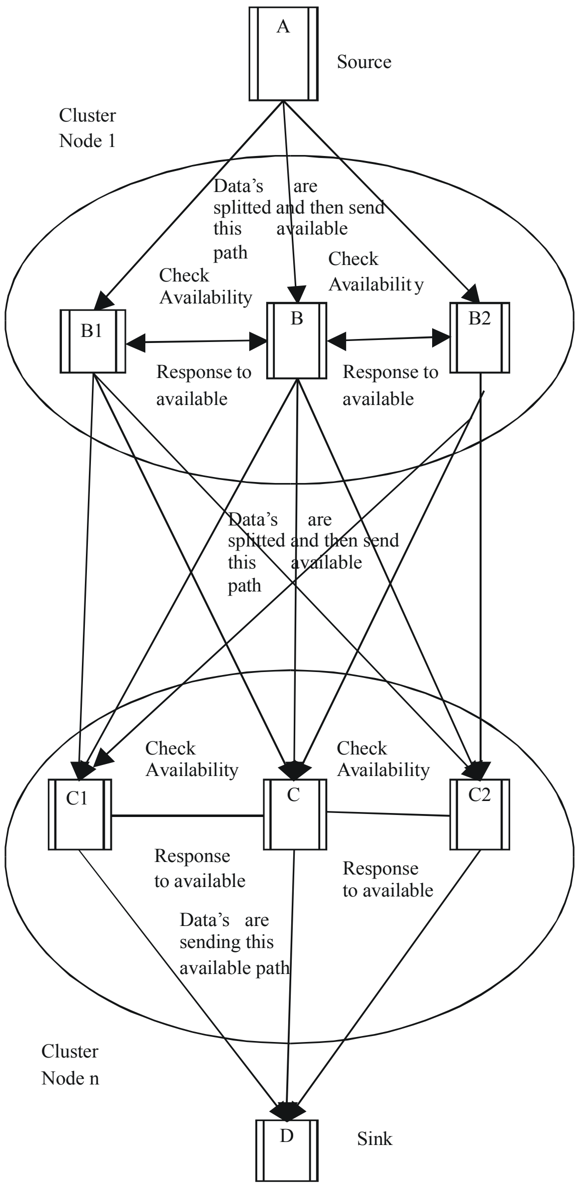
Cooperative transmission can obtain spatial diversity without using multiple antennas, thus achieving more reliable transmission or consuming less power. To realize cooperative communication in a distributed wireless network, two key questions need to be answered, namely when to cooperate and whom to cooperate with. In this paper, we propose a distributed MAC protocol with automatic relay selection to address these questions. We show by theoretical analysis and simulation results that the proposed solution outperforms. Conventional noncooperation transmission by 8 to 10 dB, for various target outage probabilities.

System Design
Implementation Phases:

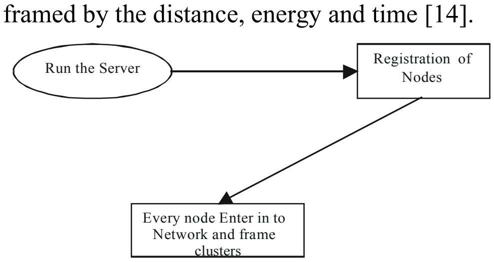
- Network Construction
- Routing The Nodes
- Recruiting-And-Transmitting Nodes
- Best Path Estimation

Network Construction: In the network, numerous nodes are interconnected and exchange data or services directly with each other. All systems have Connection with other systems. System details are maintained in the

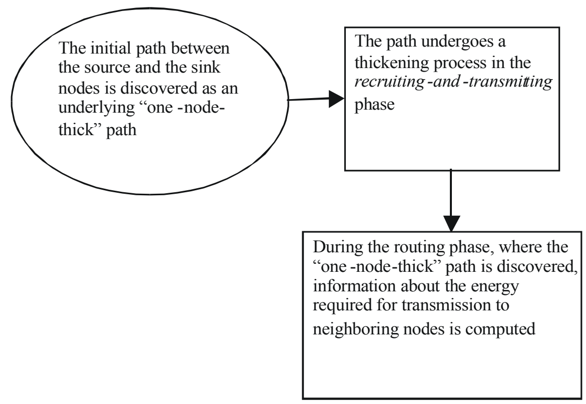
Corresponding Author: K. Rajakumari, Department of Computer Science and Engineering, Bharath University, Tamilnadu, India.



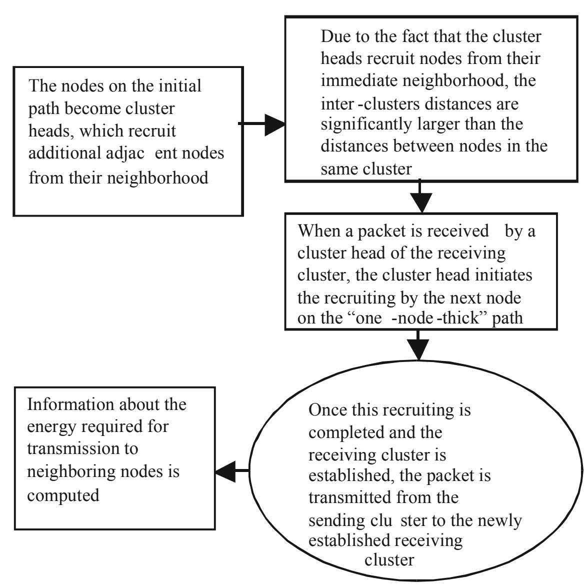
server system. It provides connection to the node whenever there is a request from another node. Choose the number of nodes and also initialize the port number. The network is created and clusters are formed. Clusters are framed by the distance, energy and time [14].



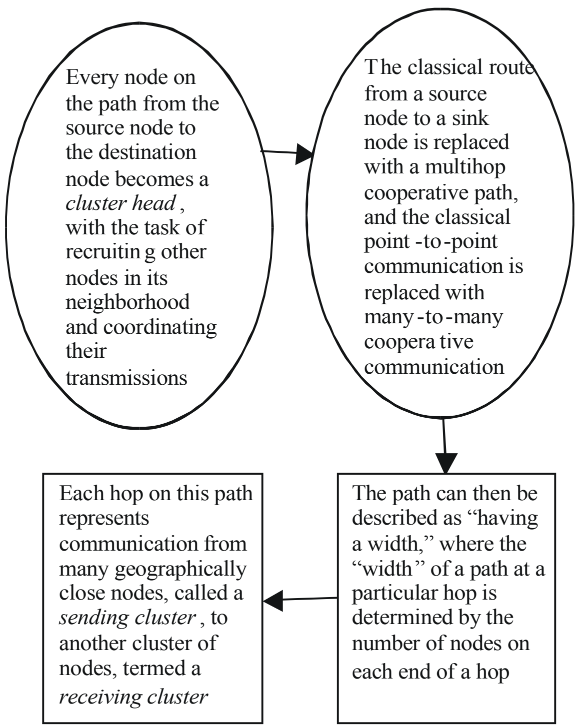
Routing the Nodes: The initial path between the source and the sink nodes is discovered as an underlying "one-node-thick" path. "one-node-thick" path is discovered, information about the energy required for transmission to neighboring nodes is computed. This information is then used for cluster establishment in the "recruiting-and-transmitting" phase by selecting nodes with lowest energy cost.



Recruiting and Transmitting Nodes: Recruiting is done dynamically and per packet as the packet traverses the path. When a packet is received by a cluster head of the receiving cluster, the cluster head initiates the recruiting by the next node on the "one-node-thick" path. Once this recruiting is completed and the receiving cluster is established, the packet is transmitted from the sending cluster to the newly established receiving cluster. Sender is forwarding the packets to receiver through the shortest path. And then Receiver receives the packets and arranges it using packet id [15].



Best Path Estimation: Every node on the path from the source node to the destination node becomes a *cluster head*, with the task of recruiting other nodes in its neighborhood and coordinating their transmissions. Consequently, the classical route from a source node to a sink node is replaced with a multihop cooperative path and the classical point-to-point communication is replaced with many-to-many cooperative communication. The path can then be described as "having a width," where the "width" of a path at a particular hop is determined by the number of nodes on each end of a hop. Each hop on this path represents communication from many geographically close nodes, called a *sending cluster*, to another cluster of nodes, termed a *receiving cluster*. The nodes in each cluster cooperate in transmission of packets, which propagate along the path from one cluster to the next [16].



CONCLUSION

In this paper, we proposed an cooperative communication protocol for the establishment of clusters and for cooperative transmission of data. Here we analyzed the robustness of the protocol to data packet loss and determined to utilize the energy efficiently. Up to 80% in energy savings can be achieved for a grid topology, while for random node placement our cooperative protocol can save up to 40% in energy consumption relative to the other protocols. The reduction in error rate and the energy savings translate into increased lifetime of cooperative sensor networks [17-22].

REFERENCES

1. Elhawary, Mohamed and Zygmunt J. Haas, 0000. Fellow, Energy efficient protocol for cooperative sensor network, IEEE.
2. Khandani, A., J. Abounadi, E. Modiano and L. Zheng, 2007. Cooperative routing in static wireless networks, IEEE Trans. Commun., 55(11): 2185-2192.
3. Shankar, N., C. Chun-Ting and M. Ghosh, 2005. Cooperative communication MAC (CMAC)-A new MAC protocol for next generation wireless LANs, in Proc. IEEE Int. Conf.Wireless Netw., Commun., MobileComput., Maui, HI, 1: 1-6.
4. Korakis, T., S. Narayanan, A. Bagri and S. Panwar, 2006. Implementing a cooperative MAC protocol for wireless LANs, in Proc. IEEE ICC, Istanbul, Turkey, 10: 4805-4810.
5. Chou, C.J. Yang and D. Wang, 2007. Cooperative MAC protocol with automatic Relay selection in distributed wireless networks, in Proc. IEEE Int. Conf. Pervasive Comput.Commun. Workshops, White Plains, NY, pp: 526-531.
6. Mirkovic, J., G. Orfanos, H. Reumerman and D. Denteneer, 2007. A MAC Protocol for MIMO based IEEE 802.11 wireless local area networks, In Proc. IEEE WCNC, Hong Kong, pp: 2131-2136.
7. Sendonaris, A., E. Erkip and B. Aazhang, 2003. User cooperation diversity- Part I: System description, IEEE Trans. Commun., 51(11): 1927-1938.
8. Sendonaris, A., E. Erkip and B. Aazhang, 2003. User cooperation diversity-Part II: Implementation aspects and performance analysis, IEEETrans. Commun., 51(11): 1939-1948.
9. Laneman, J., D. Tse and G. Wornell, 2004. Cooperative diversity in wireless Networks: Efficient protocols and outage behavior, IEEE Trans. Inf. Theory, 50(12): 3062-3080.
10. Stefanov, A. and E. Erkip, 2002. Cooperative information transmission in wireless networks, in Proc. Asian-Eur. Workshop Inf. Theory, Breisach, Germany, pp: 90-93.
10. Hunter, T. and A. Nosratinia, 2006. Diversity through coded cooperation, IEEE Trans. Wireless Commun, 5(2): 283-289.
11. Laneman, J. and G. Wornell, 2003. Distributed space-time-coded protocols for exploiting cooperative diversity in wireless networks, IEEE Trans. Inf. Theory, 49(10): 2415-2425.

12. Herhold, P., E. Zimmermann and G. Fettweis, 2005. Cooperative multi-hop transmission in wireless networks, Comput. Netw., 49(3): 299-324.
13. Kerana Hanirex, D. and K.P. Kaliyamurthie, 2013. Multi-classification approach for detecting thyroid attack, International Journal of Pharma and Bio Sciences, 4(3): B1246-B1251.
14. Khanaa, V. and K. Saravanan, 2013. Comparative study of uwb communications over fiber using direct and external modulations, Indian Journal of Science and Technology, 6(6): 4845- 4847.
15. Kumar, Giri and R. Saikia, 2013. M. Multipath routing for admission control and load balancing in wireless mesh network, International Review on Computers and Software, 8(3): 779-785.
16. Kumarave, A. and K. Rangaraj, 2013. Routing alogrithm over semi-regular tessellations. IEEE Conference on Information and Communication Technologies, ICT 2013.
17. Kumarave, A. and K. Rangarajan, 2013. Algorithm for automaton specification for exploring dynamic labyrinth, Indian Journal of Science and Technology, 6(6).
18. Shafaq Sherazi and Habib Ahmad, 2014. Volatility of Stock Market and Capital Flow Middle-East Journal of Scientific Research, 19(5): 688-692.
19. Kishwar Sultana, Najm ul Hassan Khan and Khadija Shahid, 2013. Efficient Solvent Free Synthesis and X Ray Crystal Structure of Some Cyclic Moieties Containing N-Aryl Imide and Amide, Middle-East Journal of Scientific Research, 18(4): 438-443.
20. Pattanayak, Monalisa and P.L. Nayak, 2013. Green Synthesis of Gold Nanoparticles Using Elettaria cardamomum (ELAICHI) Aqueous Extract World Journal of Nano Science & Technology, 2(1): 01-05.
21. Chahataray, Rajashree and P.L. Nayak, 2013. Synthesis and Characterization of Conducting Polymers Multi Walled Carbon Nanotube-Chitosan Composites Coupled with Poly (P-Aminophenol) World Journal of Nano Science and Technology, 2(1): 18-25.
22. Parida, Umesh Kumar, S.K. Biswal, P.L. Nayak and B.K. Bindhani, 2013. Gold Nano Particles for Biomedical Applications World Journal of Nano Science & Technology, 2(1): 47-57.