



7th International Conference on Communication, Computing and Virtualization 2016

Wireless Network Topological Routing In Wireless Sensor Networks

K.Hari Krishna ^a, Dr.Y. Suresh Babu ^b, Dr.Tapas Kumar ^c

^a Ph.D -Research Scholar- Lingaya's university & Assistant Professor, Dept. Of Computer Science & Engineering, Bharat Institute of Engineering and Technology, Email Id:kharikrishna396@gmail.com

^b Professor, P.G Dept of Computer Science , JKC College , Guntur ,yalavarthi_s@yahoo.com .

^c Professor & Dean & H.O.D, Dept. Of Computer Science & Engineering, Lingaya's University, Faridabad, Kumartapus534@gmail.Com

Abstract

Wireless Sensor Networks (WSNs) consist of thousands of tiny nodes having the capability of sensing, computation, and wireless communications. Many routing, power management, and data dissemination protocols have been specifically designed for WSNs where energy consumption is an essential design issues. Since wireless sensor network protocols are application specific, so the focus has been given to the routing protocols that might differ depending on the application and network architecture. The study of various routing protocols for sensor networks presents a classification for the various approaches pursued. The three main categories explored are data-centric, hierarchical and location-based. Each of the routing schemes and algorithms has the common objective of trying to get better throughput and to extend the lifetime of the sensor network.

A comparison has been made between two routing protocols, Flooding and Directed Diffusion, on the basis of throughput and lifetime of the network. Simulation of AODV (WPAN) is also carried over two topologies with same source and destination node.

© 2016 The Authors. Published by Elsevier B.V. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

Peer-review under responsibility of the Organizing Committee of ICCCV 2016

Keywords: Wireless Sensor Networks, Flooding, Directed Diffusion, AODV.

1. Introduction

The popularity of laptops, cell phones, PDAs, GPS devices, RFID, and intelligent computing devices is

*Corresponding Author. E-mail address: kharikrishna396@gmail.com

increasing day-by-day. This made the things cheaper, more mobile, more distributed, and more pervasive in daily life. Now, it is possible to construct a wallet size embedded system with the equivalent capability of a PC. Such embedded systems can be supported with scaled down Windows or Linux operating systems. In this scenario, the emergence of wireless sensor networks (WSNs) is essentially toward the miniaturization and ubiquity of computing devices. Sensor networks are composed of thousands of resource constrained sensor nodes and also some resourced base stations are there. All nodes in a network communicate with each other via wireless communication. Moreover, the energy required to transmit a message is about twice as great as the energy needed to receive the same message. On the other hand, using a long route composed of many sensor nodes can significantly increase the network delay. At the same time, always choosing the shortest path might result in lowest energy consumption and lowest network delay. Finally, the routing objectives are tailored by the application; e.g., real-time applications require minimal network delay, while applications performing statistical computations may require maximized network lifetime. Hence, different routing mechanisms have been proposed for different applications. These routing mechanisms primarily differ in terms of routing objectives and routing techniques, where the techniques are mainly influenced by the network characteristics

1.1 Back Ground Work

Routing is a process of determining a path between source and destination upon request of data transmission. In WSNs, the layer that is mainly used to implement the routing of the incoming data is called as network layer. When the sink is far away from the source or not in the range of source node, multi-hop technique is followed. So, intermediate sensor nodes have to relay their packets. The implementation of routing tables gives the solution. In flooding [6], the source node floods all events to every node in the network. Whenever a sensor receives a data message, it keeps a copy of the message and forwards the message to every one of its neighboring sensors and the cycle repeats. Direct Diffusion [8, 21] is the data centric protocol. It is the first proposed protocol for the wireless sensor network scenarios. If directed diffusion does not perform better than flooding, it cannot be considered viable for sensor networks. It consists of several elements: interests, data messages, gradients, and reinforcements.

When a node receives an interest, it checks if the interest exists in the cache. If no matching interest exists *i.e.*, the interest is distinct; the node creates an interest entry and determines each field of the interest entry from the received interest. This entry contains a single gradient toward the neighbour from which the interest was received, with the specified event data rate. Thus, it is necessary to distinguish individual neighbours. Any locally unique neighbour identifier like an IEEE 802.11 MAC address [10], a Bluetooth cluster address [11], a random, ephemeral transaction identifier may be applicable. If there is the matching interest entry, but no gradient for the sender of the interest, the node adds a gradient toward that neighbour and updates the timestamp and duration fields appropriately. It is mainly used for ad-hoc networks. In March 1999, the IEEE established the 802.15 [14, 15] working group as part of the IEEE Computer Society's 802 Local and Metropolitan Area Standards Committee. The 802.15 working group was established with the specific purpose of developing standards for short distance wireless networks, otherwise known as wireless personal area networks (WPANs). When two nodes want to send data at the same time, CSMA-CA [16, 17] comes into play. It gives the solution of hidden node problem in CSMA-CD, in which a node cannot detect another node that also wants to transmit packet resulting a collision. CSMA-CA protocol uses four-way handshake.

1.2 Problem Statement and Objective

Most current WSN routing protocols assume that the wireless network is benign and every node in the network strictly follows the routing behavior and is willing to forward packets to/for other nodes. Most of these protocols cope well with the dynamically changing topology. However, they do not address the problems when misbehavior nodes are present in the network.

A commonly observed misbehaviour is packet dropping. Practically, in a WSN, most devices have limited computing and battery power while packet forwarding consumes a lot of such resources. The design of routing protocols for WSN's must consider the power and resource limitation of the network nodes, the time varying

متن کامل مقاله

دریافت فوری ←

ISIArticles

مرجع مقالات تخصصی ایران

- ✓ امکان دانلود نسخه تمام متن مقالات انگلیسی
- ✓ امکان دانلود نسخه ترجمه شده مقالات
- ✓ پذیرش سفارش ترجمه تخصصی
- ✓ امکان جستجو در آرشیو جامعی از صدها موضوع و هزاران مقاله
- ✓ امکان دانلود رایگان ۲ صفحه اول هر مقاله
- ✓ امکان پرداخت اینترنتی با کلیه کارت های عضو شتاب
- ✓ دانلود فوری مقاله پس از پرداخت آنلاین
- ✓ پشتیبانی کامل خرید با بهره مندی از سیستم هوشمند رهگیری سفارشات