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"An Analysis of the QOS Parameters of Routing Of Protocols in a Wireless Sensor Network"

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Abstract – This paper focuses on the analysis and sympathetic of the quality of service parameters and routing protocols to be used in this extension. A wireless Ad-hoc network consists of wireless nodes communicating without the need for a centralized administration, in which all nodes potentially contribute to the routing process. A user can move anytime in an ad hoc scenario and, as a result, such a network needs to have routing protocols which can adopt dynamically changing topology. To accomplish this, a number of ad hoc routing protocols have been proposed and implemented, which include Dynamic Source Routing (DSR), Destination Sequenced Distance Vector (DSDV) and ad hoc on-demand distance vector (AODV) routing. In this paper, we analyze the performance differentials to compare the above-mentioned commonly used ad hoc network routing protocols.

Keywords: Quality of Service, Routing, Wireless Senor Network, Nodes.

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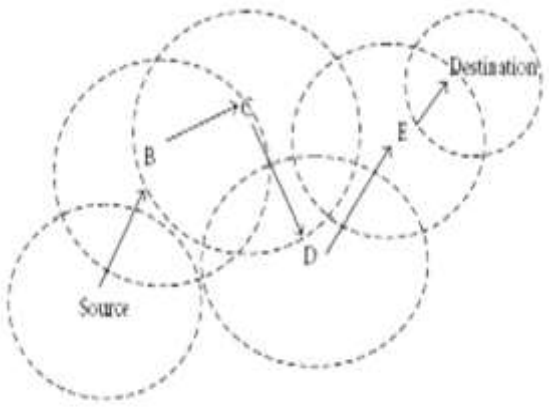
INTRODUCTION

A wireless Ad-hoc network consists of wireless nodes communicating without the need for a centralized administration. A collection of autonomous nodes or terminals that communicate with each other by forming a multi hop radio network and maintaining connectivity in a decentralized manner is called an ad hoc network. There is no static infrastructure for the network, such as a server or a base station. The idea of such networking is to support robust and efficient operation in mobile wireless networks by incorporating routing functionality into mobile nodes. Fig shows an example of an ad hoc network, where there are numerous combinations of transmission areas for different nodes. From the source node to the destination node, there can be different paths of connection at a given point of time. But each node usually has a limited area of transmission as shown in Fig by the oval circle around each node. A source can only transmit data to node B but B can transmit data either to C or D. It is a challenging task to choose a really good route to establish the connection between a source and a destination so that they can roam around and transmit robust communication. There are three major ad hoc routing protocols DSDV, DSR, and AODV, all these protocols are constantly being improved by IETF [8]. As a result, a comprehensive performance evaluation is of ad hoc routing protocols essential. We evaluated all available metrics and then performed a comparative performance evaluation. Since these protocols have different characteristics, the comparison of all performance differentials is not always possible. The comparative studies of the simulation results for these parameters for different protocols have been reported.



(i) Traffic received and sent,

(ii) Total route requests sent,

(iii) Control traffic received and sent,

(iv) Data traffic received and sent,

(v) Retransmission attempts,

Recent advances in micro-electro-mechanical systems (MEMS) and low power and highly integrated digital electronics have led to the development of micro sensors [1][2][3][4][5][5][7]. Such sensors are generally equipped with data

processing and communication capabilities. The sensing circuitry measures ambient conditions related to the environment surrounding the sensor and transform them into an electric signal. Processing such a signal reveals some properties about objects located and/or events happening in the vicinity of the sensor. The sensor sends such sensed data, usually via radio transmitter, to a command center either directly or through a data concentration center (a gateway). The gateway can perform fusion of the sensed data in order to filter out erroneous data and anomalies and to draw conclusions from the reported data over a period of time

METHODS FOR MANAGING TRAFFIC

- Traffic shaping
- Traffic policing

These methods are often necessary on the edge separating a customer's network from a provider's network. Providers often force the customer to adhere to a specific policy service (or committed rate).This policy is referred to as the Service Level Agreement (SLA) between the customer and provider. Shaping and policing mechanisms differ in how each handles violations of the SLA. Shaping is usually implemented on the customer side, and will buffer traffic that exceeds the provider's committed rate. Thus, shaping can slow the traffic rate and siphon out traffic in compliance with the provider's SLA. Buffering traffic will often create delay and jitter, which can negatively impact sensitive traffic types. Shaping also requires sufficient memory to queue buffered traffic. Shaping provides no mechanism to re-mark traffic that exceeds the committed rate. Policing is usually implemented on the provider side, and will either drop or re-mark traffic that exceeds the provider's committed rate

- *Time Interval (TC)* – identifies the time interval for each burst, measured in seconds or sometimes milliseconds. The CIR is calculated using the formula: CIR (bps) = BC (bits) / TC (seconds) With a token bucket system, the bucket is filled with tokens, and each token represents one byte. Thus, to transmit a 50-byte packet, the bucket must contain a minimum of 50 tokens. Tokens are consumed as traffic is transferred, and the bucket is refilled with tokens at the speed of the CIR. If the bucket is full, then excess tokens will spill out and are wasted. The capacity of the bucket is defined by the burst rate.

- *Generic Traffic Shaping (GTS)*: It implements shaping on a per-interface basis using the traffic-shape command. • *Class-Based Shaping*: It implements shaping on a per-class basis using the shape command within a MQC policy-map. • *Distributed Traffic Shaping (DTS)* : It offloads traffic shaping from the router processor to Versatile Interface Processors (VIPs). DTS is only available on high-end Cisco platforms.

- *Frame Relay Traffic Shaping (FRTS***)**: It implements Frame-Relay specific shaping mechanisms, such as BECN or FECN.FRTS is only available on a Frame-

ROUTING PROTOCOLS

Routing algorithms can be differentiated based on several key characteristics. First, the particular goals of the algorithm designer affect the operation of the resulting routing protocol. Second, various types of routing algorithms exist, and each algorithm has a different impact on network and router resources. Finally, routing algorithms use a variety of metrics that affect calculation of optimal routes. The following sections analyze these routing algorithm attributes.

GOALS ILLUSTRATION

Routing algorithms often have one or more of the following design goals:

- Optimality
- Robustness and stability
- Simplicity and low overhead
- Rapid convergence

CONCLUSION:

In this paper, we presented a new energy-aware QoS routing protocol for sensor networks. The protocol finds QoS paths for real-time data with certain endto- end delay requirements. The performance analysis is done on the basis of few parameters all together called Quality of service.

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