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Comparison of Sasr and Saar in Multi-Hop Wireless Networks

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Abstract: - In this paper, we argue that by carefully considering spatial reusability of the wireless communication media, we can tremendously improve the end-to-end throughput in multi- hop wireless networks. To support our argument, we propose spatial reusability-aware single-path routing (SASR) and any path routing (SAAR) protocols, and compare them with existing single- path routing and any path routing protocols, respectively. Our evaluation results show that our protocols significantly improve the end-to-end throughput compared with existing protocols. Specifically, for single-path routing, the throughput gain is up to 2.9x; for any path routing, the throughput gain is up to 62.7.
Keywords: - Underwater sensor networks, opportunistic routing, delay sensitive, energy cost.

I.INTRODUCTION

Due to limited capacity of wireless communication media and lossy wireless links, it is extremely important to carefully select the route that can maximize the end-to-end throughput, especially in multi-hop wireless networks. In recent years, a large number of routing protocols (e.g., [3],) have been proposed for multi-hop wireless networks. However, a fundamental problem with existing wireless routing protocols is that minimizing the overall number (or time) of transmissions to deliver a single packet from a source node to a destination node does not necessarily maximize the end-to-end throughput. In this paper, we investigate two kinds of routing protocols, including single-path routing and any path routing. Most of existing routing protocols, no matter single-path routing protocols or any path routing protocols, rely on link-quality aware routing metrics, such as link transmission count-based metrics (e.g., ETX [4] and EATX) and link transmission time based metrics (e.g., ETT [5] and EATT). They simply select the (any) path that minimizes the overall transmission counts or transmission time for delivering a packet. However, an important property of the wireless communication media, which distinguishes it from traditional wired communication media, is the spatial reusability. To the best of our knowledge, most of the existing routing protocols do not take spatial reusability of the wireless communication media into account. We will show the improper usage of routing metrics by existing routing protocols, when spectrum spatial reusability is not considered. In this primer work, we argue that by carefully considering spatial reusability of the wireless communication media, we can tremendously improve the end-to-end throughput in multi- hop wireless networks (i.e., up to2:9x throughput gain in single-path routing and up to62:7shown by our evaluation results). The detailed contributions of our work are as follows. To the best of our knowledge, we are the first to explicitly consider spatial reusability of the wireless communication media in routing, and design practical spatial reusability aware single-path routing (SASR) and any path routing (SAAR) protocols. We formulate the problem of spatial reusability-aware single-path routing as a binary pro-gram, and propose spatial reusability-aware single-path routing (SASR) algorithm for path selection. We further investigate the spectrum spatial reusability in anypath routing, and propose SAAR algorithm for participating node selection, cost calculation, and forwarding list determination. We have evaluated SASR algorithm and SAAR algorithm in NS-2. Our evaluation results show that our algorithms significantly improve the end-to-end throughput compared with existing ones. Specifically, for single-path routing, a throughput gain up to2:9x with a median of40 is achieved; for anypath

routing, an improvement more than10in general and up to62:7 is realized.

II.EXISTING SYSTEM

In recent years, a large number of routing protocols have been proposed for multihop wireless networks. However, a fundamental problem with existing wireless routing protocols is that minimizing the overall number (or time) of transmissions to deliver a single packet from a source node to a destination node does not necessarily maximize the end-to-end throughput. Large number of works wireless routing matrices is done in traditional wireless sensor network. In wireless communication network it is important to carefully find the high utility route in multihop wireless networks, a large number of routing protocols have been proposed for multi hop wireless networks. However, a fundamental problem with existing wireless routing protocols is that minimizing the overall number of transmissions to deliver a single packet from a source node to a destination node does not necessarily maximize the end-to-end throughput. We investigate two kinds of routing protocols, including single-path routing and any path routing. The task of a single-path routing protocol is to select a cost minimizing path, along which the packets are delivered from the source node to the destination node. In spatial reusability of wireless signals fade during propagation, two links are free of interference if they are far away enough, and thus can transmit at the same time on the same channel. To the best of our knowledge, most of the existing routing protocols do not take spatial reusability of the wireless communication. We consider spatial reusability of wireless sensor network routing using spatial reusability of by single path routing and any path routing media into account. Routing protocols are generally implemented based on transmission cost minimizing routing metrics, they cannot guarantee maximum end-to-end throughput when spatial reusability need to be considered. They need centralized control to realize MAC-layer scheduling, and to eliminate transmission contention.

The algorithms proposed in this work do not require any scheduling, and the SASR algorithms can be implemented in a distributed manner. Our approach can be extended to adapt to multiple transmission rates, as long as the conflict graph of links can be calculated. Proposed system motivate to simply select the (any) path that minimizes the overall transmission counts or transmission time for delivering a packet. In An ad hoc network wireless sensor nodes dynamically forming a network without the use of any existing network infrastructure administration. Which limit transmission range of wireless network devices, multiple networks "hops" may be needed for one node to exchange data with another across the network. So existing work proposed, a variety of new routing protocols targeted specifically at this environment have been developed, but little performance information on each protocol and no realistic performance comparison between them is available. In existing system there are some drawbacks. If a wireless node chooses a channel that is orthogonal to the channel chosen by its neighbors, then these neighboring nodes are not able to communicate with each other [1].Broadcast and uncast packets were delivered with the same probability, and, as noted in this is not a realistic assumption [3].Can't forwarding maximum packet this system.[4]'.Energy consumption was bigger challenge to wireless sensor network. In multi hop communication secure data transmission with less cost is ignored. Existing infrastructure is expensive or inconvenient to use, wireless mobile users may still be able to communicate through the formation of an ad hoc network. Although a large number of routing protocols have been implemented to find the path with minimum transmission time for sending a single packet, such transmission time reduces protocols cannot be guaranteed to achieve high end-to-end throughput.

2.1 Disadvantages of Existing System

1. Most of existing routing protocols, no matter single path routing protocols or anypath routing protocols, rely on link-quality aware routing metrics, such as link transmission count-based metrics and link transmission time based metrics.

2. Most of the existing routing protocols do not take spatial reusability of the wireless communication media into account.

III.PROPOSED SYSTEM

In this paper, we investigate two kinds of routing protocols, including single-path routing and anypath routing. The task of a single-path routing protocol is to select a cost minimizing path, along which the packets are delivered from the source node to the destination node. Recently, anypath routing appears as a novel routing technique exploiting the broadcast nature of wireless communication media to improve the end-to-end throughput. It aggregates the power of multiple relatively weak paths to form a strong path, by welcoming any intermediate node who overhears the packet to participate in packet forwarding. In the problem of routing in multi-hop wireless networks, to achieve high end-to-end throughput, it is crucial to find the "best" path from the source node to the destination node. Although a large number of routing protocols have been proposed to find the path with minimum total transmission count/time for delivering a single packet, such transmission count/time minimizing protocols cannot be guaranteed to achieve maximum end-to-end throughput. In this paper, we argue that by carefully considering spatial reusability of the wireless communication media, we can tremendously improve the end-to-end throughput in multi-hop wireless networks.

To support our argument, we propose spatial reusability-aware single-path routing (SASR) and anypath routing (SAAR) protocols, and compare them with existing single-path routing and anypath routing protocols, respectively. Our evaluation results show that our protocols significantly improve the end to end throughput compared with existing protocols. Specifically, for single-path routing, the median throughput gain is up to 60 percent, and for each source-destination pair, the throughput gain is as high as 5:3; for any path routing, the maximum per-flow throughput gain is 71.6 percent, while the median gain is up to 13.2 percent. Wireless networks are an emerging new technology that will allow users to access information and services electronically from anywhere. The premise of multi-hop transmission in wireless networks is the deployment of intermediate nodes to relay packets from the source to the destination, in scenarios where direct communication is not possible due to power or interference limitations. In wireless communication network it is important to carefully find the high utility route in multi-hop wireless networks, a large number of routing protocols have been proposed for multi hop wireless networks However, a fundamental problem with existing wireless routing protocols is that minimizing the overall number of transmissions to deliver a single packet from a source node to a destination node does not necessarily maximize the end-to-end throughput. Originally, most routing algorithms were based on min-hop count metric, which is a metric that assumes perfect wireless links and tends to minimize the number of hops on the path. However, in the face of lossy links in wireless environment, protocols using min-hop metric does not perform well because they may include some poor links with high loss ratios. Most of existing routing protocols, no matter single path routing protocols or anypath routing protocols, rely on link-quality aware routing metrics, such as link transmission count-based metrics (e.g., ETX and EATX) and link transmission time-based metrics (e.g., ETT and EATT). They simply select the (any)path that minimizes the overall transmission counts or transmission time for delivering a packet. They need centralized control to realize MAC layer scheduling, and to eliminate transmission contention. Routing protocols are generally implemented based on transmission cost minimizing routing metrics, they cannot guarantee maximum end-to-end throughput when spatial reusability need to be considered.

An important property of the wireless communication media, which distinguishes it from traditional wired communication media, is the spatial reusability. We investigate two kinds of routing protocols, including single-path routing and any path routing. In spatial reusability of wireless signals fade during propagation, two links are free of interference if they are far away enough, and thus can transmit at the same time on the same channel. To the best of our knowledge, most of the existing routing protocols do not take spatial reusability

of the wireless communication. We consider spatial reusability of the wireless communication media to improve the end-to-end throughput for that we are having two protocols spatial reusability aware single-path routing (SASR) and any path routing (SAAR) protocols. The algorithms proposed in this work do not require any scheduling, and the SASR algorithms can be implemented in a distributed manner. The task of a single-path routing protocol is to select a cost minimizing path, along which the packets are delivered from the source node to the destination node. Anypath routing [7] appears as a novel routing technique exploiting the broadcast nature of wireless communication media to improve the end-to-end throughput.

3.1 Advantages of Proposed System

1. We can achieve more significant end-to-end throughput gains under higher data rates.

IV.MODULES

We have 2 main modules,
1. Single-path Routing Module
2. Anypath Routing Module

Single-path Routing:

The task of a single-path routing protocol is to select a cost minimizing path, along which the packets are delivered from the source node to the destination node.

Anypath Routing:

This module aggregates the power of multiple relatively weak paths to form a strong path, by welcoming any intermediate node who overhears the packet to participate in packet forwarding.

V.SYSTEM CONFIGURATION

Hardware Configuration
- Processor - Pentium –IV
- Speed - 1.1 Ghz
- RAM - 256 MB(min)
- Hard Disk - 20 GB
- Key Board - Standard Windows Keyboard
- Mouse - Two or Three Button Mouse

Software Configuration
- Operating System: Windows XP
- Programming Language: JAVA

VI.CONCLUSION

In this paper, we have demonstrated that we can significantly improve the end-to-end throughput in multihop wireless networks, by carefully considering spatial reusability of the wireless communication media. We have presented two protocols SASR and SAAR for spatial reusability aware single-path routing and anypath routing, respectively. We have also implemented our protocols, and compared them with existing routing protocols. Evaluation results show that SASR achieves a throughput gain of as high as 2:9x, while for SAAR, the maximum gain can reach62:7. Meanwhile, they only require acceptable additional transmission overhead.

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