TOPOLOGY CONTROL IN MOBILE AD-HOC NETWORKS –DYNAMIC TRAFFIC PATTERN IN CAPACITY OPTIMIZED CO-OPERATIVE APPROACH

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ABSTRACT

The impacts on topology control and network capacity, especially in mobile ad hoc networks (MANETs), which can establish a dynamic network without a fixed infrastructure. A node in MANETs can function both as a network router for routing packets from the other nodes and as a network host for transmitting and receiving data. MANETs are particularly useful when a reliable fixed or mobile infrastructure is not available. The topology control issues in MANETs with cooperative communications lead to propose a Capacity-Optimized Cooperative (COCO) topology control scheme to improve the network capacity in MANETs by jointly optimizing transmission mode selection, relay node selection, in MANETs with cooperative communications. As an advancement to the COCO, with the topology control improvement, also suggesting the transmission selection from one to another using best path strategy and forwarding the information securely by encrypting the messages being transmitted between the MANETs.

INTRODUCTION

The demand for speed in wireless networks is continuously increasing. Recently, cooperative wireless communication has received tremendous interests as an untapped means for improving the performance of information transmission operating over the ever-challenging wireless medium. Cooperative communication has emerged as a new dimension of diversity to emulate the strategies designed for multiple antenna systems, since a wireless mobile device may not be able to support multiple transmit antennas due to size, cost, or hardware limitations. By exploiting the broadcast nature of the wireless channel, cooperative communication allows single-antenna radios to share their antennas to form a virtual antenna array, and offers significant performance enhancements.

Due to the lack of centralized control, MANETs nodes cooperate with each other to achieve a common goal. The major activities involved in self-organization are neighbor discovery, topology organization, and topology reorganization. Network topology describes the connectivity information of the entire network, including the nodes in the network and the connections between them. Topology control is very important for the overall performance of a MANET. For example, to maintain a reliable network connectivity, nodes in MANETs may work at the maximum radio power, which results in high nodal degree and long link distance, but more interference is introduced into the network and much less throughput per node can be obtained.

Using topology control, a node carefully selects a set of its neighbors to establish logical data links and dynamically adjust its transmit power accordingly, so as to achieve high throughput in the network while keeping the energy consumption low.

Considering both upper layer network capacity and physical layer cooperative communications, we study the topology control issues in MANETs with cooperative communications. An approach propose a Capacity-Optimized Cooperative(COCO) topology control scheme to improve the network capacity in MANETs by jointly optimizing transmission mode selection, relay node selection, and interference control in MANETs with cooperative communications. The physical layer cooperative communications have significant impacts on the network capacity, and the proposed topology control scheme can substantially improve the network capacity in MANETs with cooperative communications.

LITERATURE SURVEY

Null Convection Logic is a well-known paradigm for designing asynchronous logic circuits. The conventional CMOS-based NCL designs suffers larger area overhead and power consumption. A low power design technique called Gate Diffusion Input (GDI) has been adopted to overcome this limitation. In GDI technology, voltage swing exhibits significant voltage drop across the circuit. Therefore, not suitable for designing large combinational circuits. A novel HYBRID (CMOS+GDI) design is proposed in this work to efficiently address this issue. The HYBRID design utilizes both CMOS and GDI technology to reduce the number of transistor and power dissipation when compared to CMOS NCL circuits. The proposed approach is implemented in NCL Ripple Carry Adder (RCA) and simulated in Cadence Virtuoso for verification [1]. In digital VLSI, power dissipation has become a prime constraint. Many design architecture and techniques have been developed to reduce power dissipation. In this paper implementation of combinational circuits such as logic gates, adders and multipliers in Gate diffusion input (GDI) technique and its comparison with other logic styles is presented. This technique allows reduce power consumption, transistor count and area while maintaining low complexity of logic design. The design is simulated using Mentor Graphics Design Architect [2]. A new data structure for representing Boolean functions and an associated set of manipulation algorithms. Functions are represented by directed, acyclic graphs in a manner similar to the representation is introduced by Lee [11 and Akers 121, but with further restrictions on the ordering of decision variables in the graph. Although a function requires, in the worst case, a graph of size exponential in the number of arguments, many of the functions encountered in typical applications have a more reasonable representation. Our algorithms have time complexity proportional to the sizes of the graphs being operated on, and hence are quite efficient as long as the graphs do not grow too large. We present experimental results from applying these algorithms to problems in logic design verification that demonstrate the practicality of our approach [8].

EXISTING SYSTEM

Existing works are focused on link-level physical layer issues, such as outage probability and outage capacity. Consequently, the impacts of cooperative communications on network-level upper layer issues, such as topology control, routing and network capacity, are largely ignored. Indeed, most of current works on wireless networks attempt to create, adapt, and manage a network on a maze of point-to-point non cooperative wireless links. Such architectures can be seen as complex networks of simple links.

Cooperation alleviates certain networking problems, such as collision resolution and routing, and allows for simpler networks of more complex links, rather than complicated networks of simple links. The impacts on topology control and network capacity, especially in mobile ad hoc networks (MANETs), which can establish a dynamic network without a fixed infrastructure. A node in MANETs can function both as a network router for routing packets from the other nodes and as a network host for transmitting and receiving data.

MANETs are particularly useful when a reliable fixed or mobile infrastructure is not available. Instant conferences between notebook PC users, military applications, emergency operations, and other secure-sensitive operations are important applications of MANETs due to their quick and easy deployment.

PROPOSED SYSTEM

Due to the lack of centralized control, MANETs nodes cooperate with each other to achieve a common goal. The major activities involved in self-organization are neighbor discovery, topology organization, and topology reorganization. Network topology describes the connectivity information of the entire network, including the nodes in the network and the connections between them. Using topology control, a node carefully selects a set of its neighbors to establish logical data links and dynamically adjust its transmit power accordingly, so as to achieve high throughput in the network while keeping the energy consumption low. Topology control is very important for the overall performance of a MANET. The power consumption is a major problem in MANETs so to overcome, a novel method for making the node active only when the data is being transmitted.

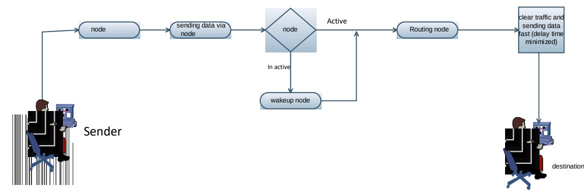

Fig 1: Proposed System Architecture

The purpose of this project is to develop software named topology enhancement which facilitates quick registration process for the node users, path construction and transmission of data. The activities of the system such as file choosing, transmission of data from sender to receiver in a secured and best path are calculated. The node registration and path construction details are saved on to the database and its made easy. All the operators of this project are trained in this area. So this project is operational feasible.

Node Creation: *Users enter the Node name, IP Address, port number and Status of the node to register in the Database. * The port number is specified unique for each IP being configured on to the network and status of each node in the network is monitored using functions like InetAddress, getLocalHost(). * While entering the next node the user must check the database for that node exists or new one. * The user can login using their node name and port number in order to enter into the system and transfer the informations.

Path Construction: * Constructs more paths for a given source to various destinations. * The path construction fully based on the destination. * The path is constructed by making using of the Socket, and the port number of the various host being configured on to the network.

Selection of Relay nodes: * Nodes are usually equipped with passive event detection capabilities that allow a node to detect an event even when its wireless communication node is in sleep mode. Upon the detection of an event by the MANETs, the node is immediately waked up and is ready to send a data. The ideal scenario is the destination nodes wakes up immediately when the source nodes send the data through various relay nodes. * The relay node is selected based on the best path to reach the destination and the data is encrypted in the source node before the transmission is yet to be carried out in order to provide security.

Message Transmission: * Transmitting the message between sender and destination using intermediate relay nodes by checking their availability and the intermediate node passes the encrypted information to this appropriate destination in MANETs. * Can type the message or choose any text files from sender nodes. That is, can browse the any files from sender node and send to destination by using any flexible paths available between them.

RESULTS AND DISCUSSION

The purpose of testing is to discover errors. Testing is the process of trying to discover every conceivable fault or weakness in a work product. It provides a way to check the functionality of components, sub assemblies, assemblies and/or a finished product It is the process of exercising software with the intent of ensuring that the Software system meets its requirements and user expectations and does not fail in an unacceptable manner.

Fig 2: Node Registration Form

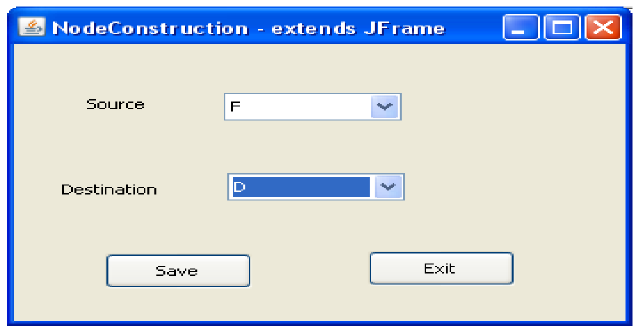

Fig 3: Node Construction Form

Fig 4: Login Form

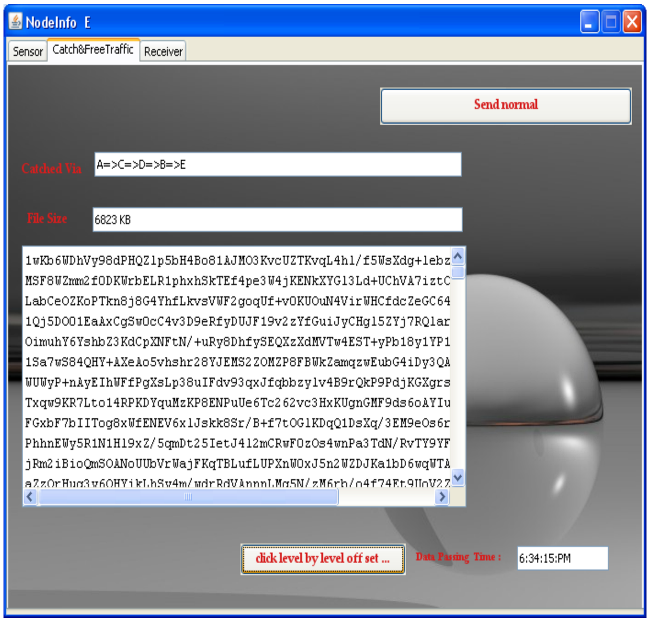

Fig 5: Data Transmission Time Form

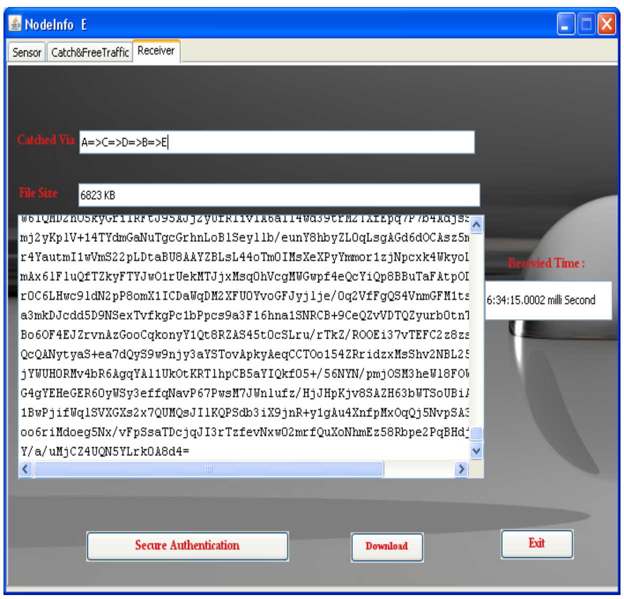

Fig 6: Encrypted Data View Form

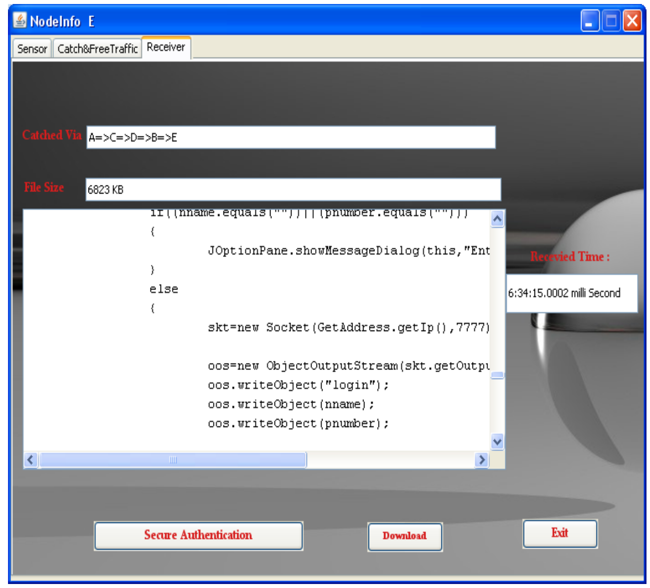

Fig 7: Receiver Decrypted Data View Form

CONCLUSION AND FUTURE WORK

Cooperative communications, topology control, and network capacity in MANETs. To improve the network capacity of MANETs with cooperative communications, proposed a Capacity-Optimized Cooperative (COCO) topology control scheme that considers both upper layer network capacity and physical layer relay selection in cooperative communications. The physical layer cooperative communications techniques have significant impacts on the network capacity, and the proposed topology control scheme can substantially improve the network capacity in MANETs with cooperative communications. The progress is to consider dynamic traffic patterns scheme to improve the performance of MANETs with cooperative communications. The network nodes are constructed and the topology is also decided by users in a mobile ad hoc networks. The physical topology transmission is done in a secured manner by encrypting the information and posting onto the network. The best flexible path is chosen for information transferring depending on the status of the nodes, between the nodes created.

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