Reducing Delay and Secure Transmission in VANET using CBDS Technique

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Abstract: Vehicular ad hoc networks (VANETs) have the potential to transform the way people travel through the creation of a safe interoperable wireless communications network that includes cars, buses, traffic signals, cell phones and other devices. Specially, data trust is evaluated based on the data sensed and collected from multiple vehicles. While node trust is assessed in two dimensions, i.e., functional trust and recommendation trust, which indicate how likely a node can fulfill its functionality and how trustworthy the recommendations from a node for other nodes will be, respectively. This trust management theme is applicable to a wide range of VANET applications to improve traffic safety, mobility, and environmental protection with enhanced trustworthiness. But these networks are vulnerable to various attacks such as sleep deprivation attack which cause delay transmission. These attacks affect the communication between the number of the vehicles or nodes. There is a need of a technique that can prevent the network from these security attacks. The proposed work implements CBDS with the help of AODV algorithm to palliate sleep deprivation attack.

Keywords: Vehicular Ad hoc Network, CBDS, AODV, NS 2.

I. INTRODUCTION

The rapidly expanding technology of cellular communication, wireless LANs, and satellite services will make information accessible anywhere and at any time. Regardless of size, most mobile computers will be equipped with a wireless connection to the fixed part of the network, and, perhaps, to other mobile computers. The resulting computing environment, which is often referred to as mobile or nomadic computing, no longer requires users to maintain a fixed and universally known position in the network and enables almost unrestricted mobility. Mobility and portability will create an entire new class of applications and, possibly, new massive markets combining personal computing and consumer electronics. This paper proposes a framework for achieving energy efficiency for the data loss tolerant applications by exploiting the multiuser diversity and DoFs available through the packet loss pattern.

II. RELATED WORKS

Maximizing energy efficiency for loss tolerant applications: The packet buffering case

For a real time application, there is a constraint on the maximum number of packets to be dropped successively that must be obeyed. We propose a channel-aware energy efficient scheduling scheme which schedules the packets such that the constraint on the average packet drop rate and the maximum number of successively dropped packets is fulfilled for the case when a finite number of unscheduled packets can be buffered.

Green Cellular Networks: A Survey, Some Research Issues and Challenges

We present a brief survey of methods to improve the power efficiency of cellular networks, explore some research issues and challenges and suggest some techniques to enable an energy efficient or "green" cellular network. Since base stations consume a maximum portion of the total energy used in a cellular system, we will first provide a comprehensive survey on techniques to obtain energy savings in base stations. Next, we discuss how heterogenous network deployment based on micro, pico and femtocells can be used to achieve this goal. Since cognitive radio and cooperative relaying are undisputed future technologies in this regard, we propose a research vision to make these technologies more energy efficient.

The global footprint of mobile communications: The ecological and economic perspective

We provide a breakdown of the global carbon footprint, which reveals that production of mobile devices and global radio access network operation will remain the major contributors, accompanied by an increasing share of emissions due to data transfer in the backbone resulting from rising mobile traffic volumes. The energy bill due to network operation will gain increasing importance in cellular business models. Furthermore, technologies to reduce energy consumption are considered a key enabling factor for the spread of mobile communications in developing countries. Taking into account several scenarios of technological advancement and rollout, we analyze the overall energy consumption of global radio access networks and illustrate the saving potential of green communication technologies.

On greening cellular networks via multicell cooperation

We overview the multi cell cooperation solutions for improving the energy efficiency of cellular networks. First, we introduce traffic-intensity-aware multi cell cooperation, which adapts the network layout of cellular networks according to user traffic demands in order to reduce the number of active base stations. Then we discuss energy-aware multicell cooperation, which offloads traffic from on-grid base stations to off-grid base
stations powered by renewable energy, thereby reducing the on-grid power consumption.

**Energy-efficient Scheduling of Delay Constrained Traffic over Fading Channels**

A delay-constrained scheduling problem for point-to-point communication is considered: a packet of B bits must be transmitted by a hard deadline of T slots over a time-varying channel. The transmitter/scheduler determines how many bits to transmit, or equivalently how much energy to transmit with, during each time slot based on the current channel quality and the number of unserved bits, with the objective of minimizing expected total energy. Assuming transmission at capacity of the underlying Gaussian noise channel, a closed-form expression for the optimal scheduling policy is obtained for the case T = 2 via dynamic programming; for T > 2, the optimal policy can only be numerically determined. Thus, the focus of the work is on derivation of simple, near-optimal policies. The proposed bit-allocation policies consist of a linear combination of a delay associated term and an opportunistic (channel-aware) term. In addition, a variation of the problem in which the entire packet must be transmitted in a single slot is studied.

**Delay-Constrained Energy-Efficient Scheduling over a Multihop Link**

This paper focuses on delay-constrained energy efficient packet transmission over a static multihop link. Optimal offline scheduling (vis-a-vis total transmission energy), assuming information of all packet arrivals before scheduling, is derived. The optimal offline schedule relies on a simple delay budget allocation scheme, which allocates the delay budget to the first hop (from source to the first relaying node) as much as possible. All the relaying nodes simply perform buffer-clearing during any transmission opportunities. The total transmission energy and average packet delay are analyzed and characterized. It is demonstrated that energy savings via multihopping are possible, but depend heavily on factors such as multihop resource or thogonalization mode, delay constraints, and SNR operating regimes.

- DSRC based on the Wi-Fi standard is widely used in VANETs for connecting the infrastructure to vehicles and vehicles to vehicles with a two way short range radios which is cheaper compared to other wireless standards that are available.
- The DSRC/WAVE systems fill a niche in wireless infrastructure by facilitating low latency, geographically local, high data rate, and high mobility communications.

**III. CBDS**

In our proposed work the Sleep deprivation attack is eliminated by black listing of malicious node after detection of node as malicious and non-malicious by using the CBDS technique and improving the reverse tracing process of CBDS with the help of AODV Algorithm. At first the network is given an input to a source, then the network simulation of the Sleep deprivation attack is done in which the some nodes are given the properties of the attacker. With the use of CBDS, the identification of the attacker is done. In reverse tracing technique, the detection message will be send to the nodes which is a secret message that will help to detect the malicious nodes. Now the nodes other than malicious nodes will not reply to the source node, only malicious nodes send the detection message reply to the source node, which help the source node to identify fake nodes. The failure of the nodes in authentication process makes them invalid and black listed in the future premises. Some brute force attacks are also assumed in the network by which the malicious node can break the CBDS reverse tracing technique.
V. CONCLUSION

In this paper, we evaluate the trustworthiness of both traffic data and vehicle nodes for VANETs along with the elimination of malicious nodes with the help of CBDS scheme and PSO algorithm. We also identified the malicious nodes and then blacklisted them at the time of the routing process. AODV algorithm was applied to improve the reverse tracing technique of the CBDS scheme. The results show significant improvement with the use of CBDS optimized with use of AODV Algorithm.

VI. REFERENCES


