

Overview on Effective Controlling Via Store-Carry and Forward Scheme in Mobile Communication

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Abstract: *The store-carry and forward (SCF) was used to achieve maximum energy savings. The works are motivated to realize substantial energy efficiency to increase in the operation of mobile networks. Evidently, the increase of data services on mobile phones has caused a considerable rise in the energy consumption of infrastructure systems. Energy utilization is imperatively important for network operation since the accumulated effect of increased data rates over cellular networks and the data traffic that needs to be supported may lead to unsustainable requirements on energy consumption in mobile networks. This paper explains a brief survey regarding the energy efficiency in mobile communication is done and analyzed.*

Keywords: Energy consumption, store-carry and forward, mechanical relaying, tailender, greedy routing

1. Introduction

Mobile computing is a technology that allows transmission of data, via a computer; they are not to be connected to a fixed physical link. Energy utilization are imperatively important for network operation because the accumulated effect of increased data rates over cellular networks and the data traffic that needs to be supported may lead to unsustainable requirements on energy consumption in mobile network.[1],[2],[3],[4],[5].

In current cellular network deployments that can potentially achieve many reductions in the end-to-end communication thus we can perverse energy consumption. The increased usage of data services on mobile phones has caused a rise in the energy consumption. Capitalizing on the elasticity of delay tolerant services, mobile terminals can transmit the transmission of information message. So the both terminals and base station require less power to communicate the information and thus conserve energy. Hence introducing the mechanical relaying, where the mobile nodes store and carry information messages while sending information from source to destination. Due to the unexpected and frequent disconnections, protocol replicate messages at node to increase the delivery rate. Finally the proposed differs from the multihop relaying where messages are forwarded as soon as possible and they become available at the relay nodes [1]. The mobility of nodes can be used to reduce the transmission energy across different entities in the system. Thus by increasing the available data rate may cause further improvement in energy savings.

The most important problem in wireless sensor networks is sensor coverage. Thus we reduce the sensor coverage so that we loss the sensor quality [9]. The two important issues that affect the sensing quality are sensor death and migration To improve the sensor quality, the actors using the spare sensors to Deficient Regions (DR) and using relocating the sensors from Bountiful Regions (BR) to DR [10]. The sensor quality are improved by introducing the concept of *Information*

Tables (IT) and threshold limits for both the allocation and relocation process. Thus by improving the sensing quality in wireless sensor networks we get better channel and hence reduce the energy transmission.

2. Literature Survey

2.1 Trends in Green Wireless Access

In this paper s. Vadgama [2] has proposed the global climate change may cause the energy reduction. In large amount of transmitted data, the continues increase in the data services may cause the increasing the energy by the factor of 10 every five years. Now a days, 3% of world -wide energy are consumed by infrastructure and communication technology (ICT) which may causes 2% of the world-wide CO₂ emissions. In the global cellular operator, the energy usage are associated with network operation hence they producing 80% of CO₂ The Doherty RF power amplifier with digital pre-distortion technology achieves overall power amplifier efficiency of 45%. Renewable energy sources are play increasingly significant role towards reducing CO₂ emissions and thus we can reduce the energy consumption.

2.2 Energy Consumption in Mobile Phones: A Measurements Study and Implications for Network Applications

In this paper the niranjan balasubramanian [9] has proposed the energy consumption characteristics of three widespread mobile networking technologies. Mobile networking technologies like 3G, GSM and Wi-Fi and the 3G and GSM incur high tail energy overhead. TailEnd is used to develop a protocol that reduces energy consumption of common mobile phones. TailEnd has two classes of applications: 1) delay-tolerant applications such as email and RSS feeds 2) applications such as web search and web browsing that can benefit from aggressive perfercting. In 1996-2008, the average total phone weight and average nominal battery capacity on newly introduced models of mobile devices are

increased. So that high energy densities are effectively used by all mobile network devices. Energy wastes in every part of Internet infrastructure are widely increased, to preserve the battery capacity; the device is not actively used. In other terms, if it is deemed that the cellular phone is not in active use, it enters the paging mode and periodically checks the network, it will allowed the entire process to be powered off. To decreasing energy consumption we can adopt an information centric approach.

2.3 Future Wireless Mobile Networks: Energy Consumption and Resource Utilization in Mechanical Relaying.

In this paper P. Kolios, V. Friderikos, and K. Papadaki [5] has proposed the 3G mobile communication system in networking. In 3G mobile communication Systems they finding the location of the mobile phone is one of the important features. When locating a mobile phone, some issues are occurred in mobile communication.. Some issues may include the cell-ID-based, the assisted GPS, and the TDOA-based methods. The cell-ID-based method has the worst positional accuracy but the A-GPS has the best positional accuracy. For cell-based methods, the accuracy should be very close to the radius of the cell. For TDOA-based methods, the accuracy of less than 100m in 67 percent of calls. For A-GPS methods, an accuracy of under 100m in 67 percent of calls when SA is off.

2.4 Optimal Fixed and Scalable Energy Management for Wireless Networks

In this paper R. Mangharam [8] has proposed the energy-aware management in cellular networks. To characterize the amount of energy can be saved by reducing the number of active cell. Thus the energy savings approach calculates the original network dimension and comprising a large number of small cells. Assume that during peak traffic periods an area is served by K cells, each one with traffic f, achieving the quality of service. When traffic declines, say xKf in the whole area, just xK cells are necessary to obtain the same QoS, provided that coverage is preserved. Thus (1-x)K cells can be switched off out of K, saved a fraction of energy equal to(1-x). When (1-x)K cells is switched off, the power consumption reduces to a fraction x of the original value. In this way switching off a smaller number of cells for longer periods might yield larger energy savings.

2.5 Load Balancing via Store-Carry and Forward Relaying in Cellular Networks

In this paper P. Kolios, V. Friderikos, and K. Papadaki has proposed the load balancing method. In fast changing environment, mobile operators needs to constantly increase their network capacity to meet the growth of internet services. One important element of future cellular networks is the support of multihop relaying. Thus reducing the energy efficiency.

2.5.1 Mechanical Relaying in Cellular Networks

The mechanical relaying paradigm, mobile nodes can postpone forwarding of received messages to allow highly localized transmissions.

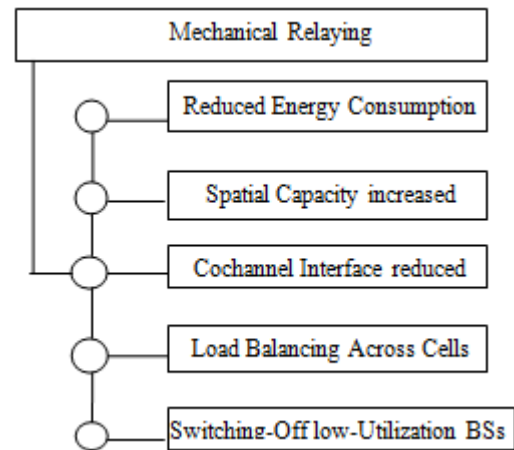


Figure 2: Benefits of mechanical relaying in cellular networks.

The information messages have to be forwarded as soon as they received, a set of potential benefits in the operation of emerging or future cellular network can be envisioned. The spatial capacity is defined as the network aggregate capacity per unit area, denoted in bits per second per square meter, i.e. b/s/m².

3. Techniques Used for Energy Efficiency

The future vehicle position can be predicated accurately by the mobility model. To solve this problem, *iterative SCF schemes* are used [1]. The iterative SCF scheme performance are compared with two extreme cases:1) the case where exact location information for the entire time horizon is available and 2) the case where only initial vehicle location information is available and node replication on the space-time network is done assuming constant speed and direction. The iterative-SCF scheme is described by Algorithm 1.

Algorithm 1. Iterative-SCF scheme.

Ensure $k = 0$.

- 1: update vehicle positions based on newly received vehicle location information.
- 2: update supply/ demand parameters.
- 3: reconstruct space time network using steps 1, 2.
- 4: solve problem (P1) for time horizon $t = KT, KT + 1, \dots, KT + T$
- 5: Execute decisions for the first x time periods
- 6: $k = k + x$; Go to step 1.

The iterative-SCF scheme (algorithm 1) recomputed the forwarding decisions at rate x . Initially, using the most recent node location information in (step 1) and updating requests in (step 2), the space-time network are constructed in (step 3). Then the forwarding paths are derived in (step 4) for the next T time periods, but only the decisions for the next x time periods are executed in (step 5) before computing the forwarding policies

The arrival of new upload request the optimization entity generates the network graph. To generate a new route, the optimization entity needs knowledge on the current utilization values and previously generated paths that overlap in time. Therefore, the transmission links that have

been included in the forwarding paths of previously generated routes area excluded from currently generated graph. In this way, the optimization problem for single request reduces to the shortest path problem. The optimal routing policy for uploaded request in the online implementation of problem can be solving the *greedy routing algorithm* [7].

MEERA is a cross-layer optimization scheme that fully exploits the possible energy savings by RF components [12]. To minimize energy consumption of a wireless transceiver while meeting the timeliness requirements for multiple users. For example, variable energy cost is minimized by transmitting at a lower modulation rate and transmission power, but also shortens the sleep duration, so increasing fixed energy consumption. Then we are applying energy-efficient resource allocation across the physical layer, communications layer, and link layer. MEERA's system-wide resource allocation consumes 2 to 9 times less energy than current adaptive schemes.

Survey for next year's including:

- The usage of high temperature electronics and alternative energy backup solutions instead of batteries
- The distributed computing and data storage, to enable next generation peer-to-peer and content distribution services at minimum energy cost.
- The key here to find a suitable trade-off between the power consumption analog and digital hardware blocks.
- The transmission energy across different entities in the system.
- By using the cross layer optimization, the physical and MAC layer optimized for maximum energy efficiency.
- Shorter coherence times where coarse-grain resource allocation decisions made by the AP are complemented by fine-grained adaptation at the node.
- By implementing the TailEnd in the kernel and refining the API to make it easily usable by users or application development.
- Solar power and wind energy can usefully complement and reduce the net electrical power intake from the grid.

4. Conclusion

The detailed survey on energy efficiency in mobile communication is done which includes a store-carry and forward strategy to achieve savings in transmission energy.. We study how this reduction in energy translates into message delivery delay and obtained optimal tradeoffs for these competitive objectives. Thus by increasing the available data rate and node density for further improvements in energy savings can be attained.

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