

Survey on Energy Efficient Multimedia Delivery in Wireless Networks using a Cross Layer Quality Oriented Scheme

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Abstract

Battery is considered as the backbone of any communication device. Today Limited battery performance is becoming a threathful issue. To overcome this, problem “A cross layer quality oriented energy efficient multimedia delivery scheme (Q-PASTE) is proposed. It consists of two components deployed at different network layers: the application layer Packet/Application manager(PAT) and the medium access control (MAC)layer Slow sTart Exponential and Linear Algorithm (STELA).Energy efficiency of user mobile devices can be improved by the technique E-PoFANS “the Enhanced Power-Friendly Access Network Selection Mechanism”. Considering all network conditions, the mobile device can automatically perform energy efficient network selection. Battery performance can be improved by using different traffic shaping techniques. The proposed scheme improves energy efficiency also.

Keywords: E-PoFANS, Cross-Layer Solution, Energy Efficiency, Mobile Multimedia

I. INTRODUCTION

With the increasing popularity of the new smart devices and their applications, mobile users are demanding more multimedia services at higher quality. Considering all network conditions, the mobile devices can automatically perform energy efficient network selection. There are different techniques that used to improve the performance of battery.

First technique is,” The enhanced power friendly access network selection mechanism (E-PoFANS), which increase the energy efficiency of content delivery and prolongs the mobile device battery lifetime by selecting the network that offers the best energy quality trade-off.

Second technique, for improving battery performance by using traffic shaping techniques. Batteries store chemical energy and deliver electrical energy through an electro chemical conversion process. This technique maximizes the energy delivered by the cell at the cost of an additional delay.

Third technique, MAC protocol for distributed cognitive radio networks. An Opportunistic Multi-channel (OMC) MAC ensures priority of delay sensitive applications over general users and calculates the maximum number of prioritized applications in the system based on their QoS requirements, which can be used to develop admission control modules.

Fourth technique, Channel reservation MAC(CR-MAC)protocol, which presents a novel contention based medium access control(MAC)protocol.CR-MAC protocol achieves much higher throughput and better fairness than IEEE 802.11 RTS/CTS mode under saturated traffic.

Finally a new technique is introduced to increasing the energy efficiency, battery lifetime and higher user quality experience by using traffic shaping method known as Q-PASTE (cross layer quality –oriented energy efficient multimedia delivery scheme). It consists of two components deployed at different network layers: the application layer Packet/Application manager (PAT) and the medium access control (MAC) layer Slow Start Exponential and linear algorithm(STELA). PAT is located at both the service gateway and the client host, whereas STELA is employed at the client side only.

II. THE ENHANCED POWER FRIENDLY ACCESS NETWORK SELECTION MECHANISM (EOFANS)

EoFANS enables the battery life of the mobile device to last longer, while performing multimedia content delivery, and when integrated in user mobile devices it will automatically perform energy efficient network selection for the users, considering user performances, application requirements, and network conditions. EoFANS indicates the best target network option and triggers the handover process. The results show how by using E-PoFANS, the users achieve up to 30% more energy savings with insignificant degradation in quality, in comparison with another state-of-the-art energy efficient network selection solution.

III. IMPROVING BATTERY PERFORMANCE BY USING TRAFFIC SHAPING TECHNIQUES

This technique maximizes the energy delivered by the cell at the cost of an additional delay. This discharge process can be used for any kind of portable wireless devices. Furthermore, methods are required to discharged demand of the battery. And also better the performance, it is necessary to find different methods for shaping the discharged demand process. Batteries store chemical energy and deliver electrical energy through an electrochemical conversion process. A battery consists of one or more cells, organized in an array. Each cell consists of an anode, a cathode, and the electrolyte that separates the two electrodes and allows the transfer of electrons as ions between them. Chemical material that originates chemical reactions within the cell is called active material.

IV. DESIGN OF OMC-MAC: AN OPPORTUNISTIC MULTI-CHANNEL MAC WITH QOS PROVISIONING FOR DISTRIBUTED COGNITIVE RADIO NETWORKS

In this method, a novel MAC design for distributed cognitive radio network (DCRN) which provides an efficient approach to address quality of service (QoS) requirements of delay sensitive applications by defining higher priority to such applications during channel reservation. Therefore, the network initialization, reconfiguration and coordination is easier and reliable even in presence of heterogenous spectrum availability.

V. A NOVEL CONTENTION-BASED MAC PROTOCOL WITH CHANNEL RESERVATION FOR WIRELESS LANS

The channel reservation(CR)MAC protocol takes advantage of the overhearing feature of the shared channel to exchange channel reservation information with little extra overhead. Moreover, under unsaturated traffic, the protocol also achieves higher throughput and better fairness than IEEE 802.11 RTS/CTS.

VI. A CROSS- LAYER QUALITY –ORIENTED SCHEME FOR ENERGY EFFICIENT MULTIMEDIA DELIVERY IN WIRELESS NETWORKS (Q-PASTE)

Q-PASTE relies on a single energy–aware MAC behavior per client based on application layer traffic pattern related information. It can be applied for both constant bit rate and variable bit rate applications. It is used to increase energy efficiency, battery lifetime and high user quality experience. Both mathematical analysis and experimental evaluation have demonstrated how energy can be saved by employing the proposed approach in comparison with the existing state-of-the-art techniques while maintaining good quality levels.

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