JOKER: A NOVEL OPPORTUNISTIC ROUTING PROTOCOL

OBJECTIVE:

In this work, an opportunistic routing protocol, called JOKER, addressing the trade-off between QoE in multimedia transmissions and energy has been presented. Following the opportunistic paradigm, JOKER presents novelties in both the candidate selection, where a new metric that gathers the packet-delivery reliability of the links with the distance-progress towards the final destination has been introduced, We highlight the performance of JOKER-timer that increases the network reliability and hence the multimedia service quality without adding extra overhead

ABSTRACT:

The increase in multimedia services has put energy saving on the top of current demands for mobile devices. Unfortunately, batteries' lifetime has not been as extended as it would be desirable. For that reason, reducing energy consumption in every task performed by these devices is crucial. In this work, a novel opportunistic routing protocol, called JOKER, is introduced. This proposal presents novelties in both the candidate selection and coordination phases, which permit increasing the performance of the network supporting multimedia traffic as well as enhancing the nodes' energy efficiency. JOKER is compared in different-nature test-benches with BATMAN routing protocol, showing its superiority in supporting a demanding service such as video-streaming in terms of QOE, while achieving a power draining reduction in routing tasks.

INTRODUCTION:

OPPORTUNISTIC networks have emerged as a new networking-paradigm that is attracting the research community's interest due to its potential for enhancing communications between mobile smart devices. These networks are an evolution of the MANETs (Mobile Ad-hoc NETworks), including new functionalities that make them more efficient than their precursors. Specifically, opportunistic networks take advantage of the broadcast nature of the wireless networks, i.e., direct communications between two nodes can be overheard by nearest neighbors. In ad-hoc multi-hop networks, traditional routing protocols such as OLSR (Optimized Link State Routing) , AODV (Ad-hoc On-Demand Distance Vector) , or BATMAN (Better Approach To Mobile Ad-hoc Networking) calculate a unique route between transmitter and receiver. Thus, each node just considers one single neighbor as the next hop to reach a given destination. However, with opportunistic routing protocols each node selects a set of its neighbors, referred to as candidates, as the potential next hops towards the final destination. The way each node selects its candidates and how they coordinate each other to pick the most proper candidate as the actual forwarder are the two key challenges in opportunistic routing. These characteristics determine the effectiveness of the opportunistic routing algorithm . Having different candidates to forward a packet may provoke multiple copies of the same packet in the network, causing extra overhead, collisions, etc. Thus, adequate candidate coordination schemes are needed in order to achieve an efficient synchronization among the possible forwarders. Furthermore, depending on the topology and the characteristics of the services flowing through the network, considering the greatest number of candidates is not always advantageous. In next sections this fact is clearly manifested and, under some conditions, considering a low number of candidates permits reaching higher levels of quality (Quality of user Experience) than employing a higher number of potential forwarders. Another important point affecting ad-hoc networks is the terminals' energy consumption. As these devices are usually battery powered, the development of power-efficient techniques to diminish energy consumption in communication networks is a compelling need. Wireless card

energy consumption has a remarkable weight in mobile devices' power draining , thereby, the development of efficient networking protocols and procedures is necessary in order to extend battery lifetime. Given the higher efficiency of opportunistic protocols compared to traditional proposals, the former may represent a real alternative for reducing the energy consumed in routing tasks.