Impact of Mobility on User-centric Routing

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***Abstract*—This poster presents work focused on the analysis of the impact of mobility of wireless nodes in multihop routing. Expected contributions out of this work relate to novel forwarding concepts that will help to allow robust message forwarding across graphs where nodes exhibit human behaviour movement patterns, as is the case for most of user-centric wireless networks today.**

***Index Terms*—Mobility impact, user-centric, wireless, multihop routing.**

The most recent paradigms in wireless architectures describe environments where nodes present a somewhat dynamic behaviour (e.g. *Mobile Ad-hoc Networks*) or even a highly dynamic behaviour (e.g., *User-provided Networks*). The most popular routing protocols in such environments rely on the paradigm of *single-source shortest-path* computation. Albeit sufficient to provide one path between a source and a destination, such routing behaviour is not adequate to a highly nomadic lifestyle that Internet users are today experiencing.

The poster presents initial work based on my PhD studies and is focused upon the most recent trends in group-based mobility modeling/prediction and analyze up to which point can mobility features be integrated into routing metrics, so that these become more adaptive and better suited to wireless environments showing a high variability of node movement. The remainder document is organized as follows. Section 1 presents motivation and goals for the developed work, while section 2 is dedicated to the current status. We conclude in section 3 describing steps to be taken next.

The most popular multihop routing approaches of today are based on the single-source-shortest-path paradigm, and normally relies on static link cost metrics such as hop count. When facing movement of the nodes, multihop routing has its own shortfalls e.g., the need to recompute paths frequently if nodes exhibit high variability in movement of the nodes. In other words, current multihop approaches lack sensitivity in what concerns nodes movement. The goal of this work is to develop routing metrics and if necessary algorithms that add more flexibility to routing in what concerns mobility, thus resulting into more robust and less costy (in terms of signaling overhead) routing.

The work developed relates to the analysis of different link metrics based upon the most recent paradigms of human mobility modelling. A number of mobility routing metrics have been reviewed to examine which one of the available metrics can best capture mobility of nodes in a network, which can ultimately be integrated in routing. In addition, a new metric that takes into consideration the potential notion of link duration is ongoing. The definition of heuristics and of new metrics is being validated both from an analytical perspective (against related work) and also by means of simulations, being the tool of choice the network simulator ns2.

As next steps, we will analyse different devised metrics (and heuristics) into our simulation environment, which relies on ns2. The metrics are to be applied to the two basic families of multihop routing (link-state and distance-vector) in the form of DYMO and of OLSR. Performance evaluation is then to be performed against a number of varying but realistic parameters, e.g., different topology sets, different mobility models. Results to be obtained will consider the impact of mobility and how/if the new metrics improve routing by analysing performance parameters such as reduction of routing overhead.