



SERVICE PRIORITIZATION IN NODE-DISJOINT ROUTING FOR AD HOC NETWORKS BASED ON QoS

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ABSTRACT —

Ad hoc network (MANET) is a collection of mobile nodes that can communicate with each other without using any fixed infrastructure. To support multimedia applications such as video and voice MANETs require an efficient routing protocol and quality of service (QoS) mechanism. Node-Disjoint Multipath Routing Protocol (NDMR) is a practical protocol in MANETs: it reduces routing overhead dramatically and achieves multiple node-disjoint routing paths. QoS support in MANETs is an important issue as best-effort routing is not efficient for supporting multimedia applications. This paper presents a novel adaptation of NDMR, QoS enabled NDMR, which introduces agent-based SLA management. This enhancement allows for the intelligent selection of node-disjoint routes based on network conditions, thus fulfilling the QoS requirements of Service Level Agreements (SLAs).

Keywords— MANET, Node-Disjoint, Multipath, Management Protocols

1. INTRODUCTION

Mobile ad hoc networks are infrastructure less networks that can be rapidly deployed. They are characterized by multihop wireless connectivity, frequently changing network topology and the need for efficient dynamic routing protocols [1]. There are no static nodes such as base stations in the network. Each mobile node operates not only as a host but also as a router, forwarding packets to other mobile nodes in the network that may not be within direct wireless transmission range of each other. The design of efficient and reliable routing protocols in such a network is a challenging issue. On-demand routing protocols are widely used because they use much lower routing load than proactive protocols [2]. Ad Hoc on-demand Distance Vector (AODV) [3] and Dynamic Source Routing (DSR) [4] are the two most widely studied on-demand ad hoc routing protocols. The limitation of both of them is they build and rely on a unipath route for each data transmission. Whenever there is a link break on the route, both of the two protocols need to initiate a new route discovery process. This results in a high routing load. On-demand multipath

routing protocols can alleviate these problems by establishing multiple routes between the source node and destination node during one route discovery process. A new route discovery is initiated only when all the paths fail or only one path is available. This paper presents an approach built on the Node-Disjoint Multipath Routing Protocol (NDMR) [5]. NDMR has two novel aspects compared to the other on-demand multipath protocols: it reduces routing overhead dramatically and achieves multiple node-disjoint routing paths [5].

Because of the rising popularity of multimedia applications in the commercial environment and the ever growing requirements of mission-critical applications in the military arena, a best-effort service cannot meet all requirements in most situations. QoS support in mobile ad hoc networks has become an important area of research. Compared to the demands of traditional data only applications, these new requirements generally include high bandwidth availability, high packet delivery ratio and low delay rate.