
A multiple-metric QoS-aware implementation of the optimised link state routing protocol

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Abstract: The optimised link state routing (OLSR) protocol is one of the most promising for mobile ad hoc networks (MANETs). Despite numerous proposals for quality of service in MANET, there is a lack of OLSR implementations that efficiently support applications with stringent QoS constraints like VoIP or videoconference. In this paper, we present a QoS-OLSR implementation based on a multiple-metric approach. We first describe how QoS metrics values are estimated and disseminated. Then we show how the multipoint relays (MPR) can be selected using the QoS metrics as criteria, while keeping low the number of MPR in order to ensure flooding optimisation. The underlying problem is formally presented as a multicriteria problem. Finally, a heuristic is proposed in order to find quickly a satisfying solution to this latter. The evaluations carried out using OPNET show that, despite the additional traffic introduced by the dissemination of QoS information, QoS-OLSR achieves better performance than native OLSR for best-effort applications as well as for applications that are subject to QoS constraints.

Keywords: optimised link state routing; OLSR; multipoint relays; MPR; quality of service; QoS; mobile ad hoc networks; MANETs.

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Biographical notes: Patrick Sondi is Postdoctoral Researcher at IFSTTAR where he works on the telecommunication subsystem of the European Rail Traffic Management System. He received his PhD in Computer Science at University of Valenciennes where he ensures courses in computer networks and security. His research areas of interest include protocol design, QoS, security and performance evaluation of network architectures for transport systems (MANETs, GSM-R, LTE).