RESEARCH-ARTICLE

Mobile Matrix: A Multihop Address Allocation and Any-to-Any Routing in Mobile 6LoWPAN

Authors: Bruno P. Santos, Olga Goussevskaia, Luiz F.M. Vieira, Marcos A.M. Vieira, Antonio A.F. Loureiro Authors Info & Claims

Q2SWinet '17: Proceedings of the 13th ACM Symposium on QoS and Security for Wireless and Mobile Networks • November 2017 • Pages 65–72 • https://doi.org/10.1145/3132114.3132126

Published: 21 November 2017

ABSTRACT

In this work, we present Mobile Matrix, a routing protocol for 6LoWPAN that uses hierarchical IPv6 address allocation to perform any-to-any routing and mobility management without changing a node's IPv6 address. In this way, device mobility is transparent to the application level. The protocol has low memory footprint, adjustable control message overhead and achieves optimal routing path distortion. Moreover, it does not rely on any particular hardware for mobility detection, such as an accelerometer. Instead, it provides a passive mechanism to detect that a device has moved. We present analytic proofs for the computational complexity and efficiency of Mobile Matrix, as well as an evaluation of the protocol through simulations. Finally, we propose a new mobility model, to which we refer as cyclical random waypoint mobility model, that we use to simulate mobility scenarios, where communication is carried out in environments with limited mobility, such as 6LoWPANs deployed in office buildings, university campuses, concert halls or sports stadiums. Results show that μMatrix deliveries

1. Nils Aschenbruck, Raphael Ernst, Elmar Gerhards-Padilla, and Matthias Schwamborn. 2010. BonnMotion: a mobility scenario generation and analysis tool. In EAI ICST. 51.

2. Fan Bai and Ahmed Helmy. 2004. A survey of mobility models. Wireless Adhoc Networks (2004).

3. Ludovic Bellier, Karim El Malki, Claude Castelluccia, and Hesham Soliman. 2008. Hierarchical Mobile IPv6 (HMIPv6) Mobility Management. RFC 5380. (2008).

Show All References

Index Terms

Mobile Matrix: A Multihop Address Allocation and Any-to-Any Routing in Mobile 6LoWPAN

Networks

Network protocols

Network layer protocols

Network protocol design

Comments

DL Comment Policy

Comments should be relevant to the contents of this article, (sign in required).

Comments

Tweet Share Sort by Newest

Nothing in this discussion yet.

View Table Of Contents