



Review

Energy efficient wireless unicast routing alternatives for machine-to-machine networks

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ABSTRACT

Machine-to-machine (M2M) communications is a new and rapidly developing technology for large-scale networking of devices without dependence on human interaction. Energy efficiency is one of the important design objectives for machine-to-machine network architectures that often contain multi-hop wireless subnetworks. Constructing energy-efficient routes for sending data through such networks is important not only for the longevity of the nodes which typically depend on battery energy, but also for achieving an environmentally friendly system design overall, which will be imperative as M2M networks scale in number of nodes as projected. The objective of this survey is to provide a comprehensive look into shortest-path based energy-efficient routing alternatives to provide a reference for system designers as well as researchers. We start by describing M2M and its application areas, as well as its challenges. Next, a detailed account of energy-efficient unicast routing alternatives, with a particular focus on those based on additive link cost is given. Following a novel comprehensive classification of shortest-path-based energy-efficient routing algorithms designed for wireless ad hoc and sensor networks, we end by comparisons and discussions of the use of different cost metrics.

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