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RESEARCH ARTICLE

Abstraction for Asymmetric Mobile Ad Hoc Network Using Bidirectional Routing Protocols

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Abstract- ***Wireless links are often asymmetric due to heterogeneity in the transmission power of devices, non-uniform environmental noise, and other signal propagation phenomenon's. Unfortunately, routing protocols for mobile ad hoc networks typically work well only in bidirectional networks. This project first presents a simulation study quantifying the impact of asymmetric links on network connectivity and routing performance. It then presents a framework called BRA that provides a bidirectional abstraction of the asymmetric network to the routing protocols. BRA works by maintaining multi-hop reverse routes for unidirectional links and provides three new abilities: Improved connectivity by taking advantage of the unidirectional links, reverse route forwarding of control packets to enable off-the-shelf routing protocols, and detecting packet loss on unidirectional links. Extensive simulations of AODV layered on BRA shows that packet delivery increases substantially (two-fold in some instances) in asymmetric networks compared to regular AODV, which only routes on bidirectional links.***

Index Terms- Ad hoc network; asymmetry; routing; unidirectional links

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