Location-Based Routing

An overview and possible directions for GeoCRON

Kyle E. Benson

Department of Computer Science
University of California, Irvine
Irvine, California 92697

kebenson@uci.edu

May 14, 2013

Introduction

- Traditional routing
  - Unique address: IP, MAC, Peer ID, etc.
  - Source routing: next hop address, neighbor index
  - Local routing: distance-vector, link state, label-switching

Introduction

- Traditional routing
  - Unique address: IP, MAC, Peer ID, etc.
  - Source routing: next hop address, neighbor index
  - Local routing: distance-vector, link state, label-switching
- Why location information?
  - Geocast: message all (or some) nodes in target region
  - Latency: request from closer server, route locally when possible
  - Congestion: confine route requests to smaller regions (MANETs)
  - Energy: closer nodes need less radio power to reach
  - Sensors: regional event detection, spatial querying
  - Planning: paths (robots), surveillance cameras (focus on area target will appear next)
  - Recovery: avoid problematic areas of the network

Introduction

- Traditional routing
  - Unique address: IP, MAC, Peer ID, etc.
  - Source routing: next hop address, neighbor index
  - Local routing: distance-vector, link state, label-switching
- Why location information?
  - Geocast: message all (or some) nodes in target region
  - Latency: request from closer server, route locally when possible
  - Congestion: confine route requests to smaller regions (MANETs)
  - Energy: closer nodes need less radio power to reach
  - Sensors: regional event detection, spatial querying
  - Planning: paths (robots), surveillance cameras (focus on area target will appear next)
  - Recovery: avoid problematic areas of the network
    - our primary interest!

Roadmap

Location Service

- Nodes have GPS
- But how to look up destination's location?
  - placeholder

Roadmap

Location Service

mention voids

Roadmap

Roadmap

Geometric Routing

right-hand rule analagous to following the right hand wall in a maze introduced in Compass Routing on Geometric Networks

Roadmap

Clustering

In [1], an inter-zone clustering protocol is periodically run to update with information about inter-zone links. Does not give information about exact location of destination within a zone and so still need to find that.

References

M. Joa-Ng and I.-T. Lu, "A peer-to-peer zone-based two-level link state routing for mobile ad hoc networks," pp. 1415–1425, 1999. [Online]. Available: http://ieeexplore.ieee.org/xpls/abs_all.jsp?arnumber=779923&tag=1