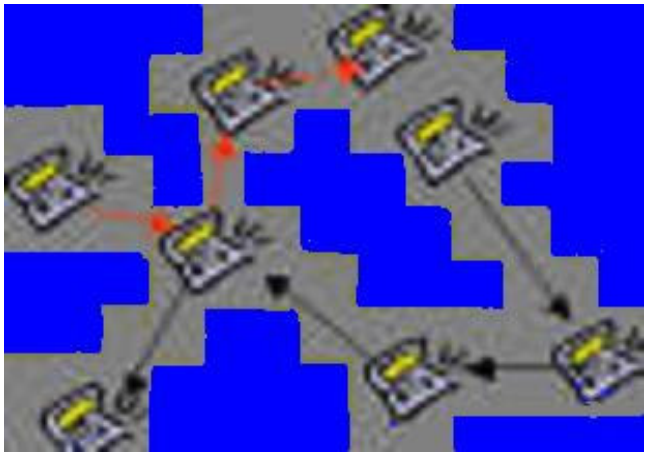
Analyzing Renaming Algorithms for MANET



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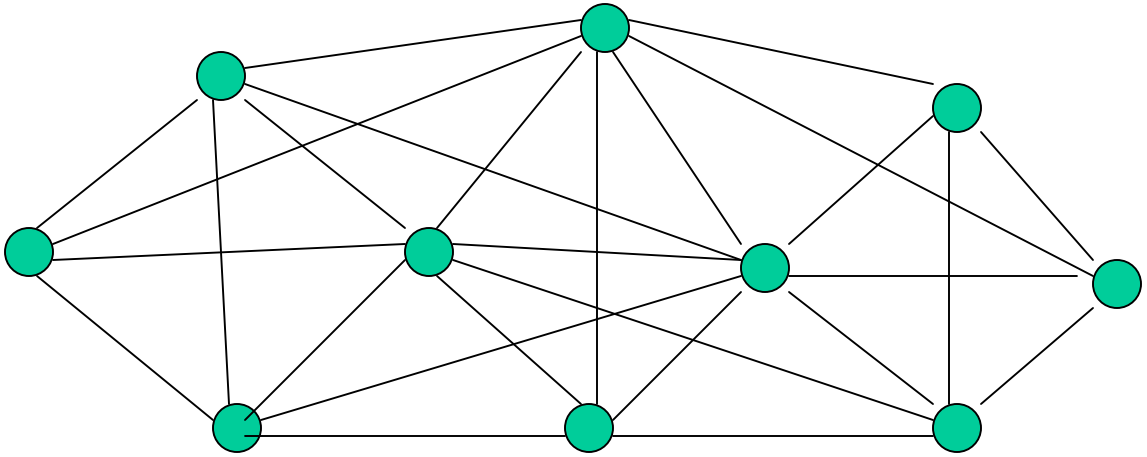
Objective

- To come up with efficient new algorithms for doing renaming in mobile ad hoc networks(MANET).
- MANET- a collaborative group of mobile nodes with wireless communication links.



Objective(2)

- Renaming Problem- nodes begin with ids chosen from a large name space and are to choose new, unique, ids that are from a smaller name space.(Attiya, 1990)

- One Application – the automatic dynamic assignment of IP addresses to nodes (Vaidya, 2002)

Adapting a Renaming Algorithm for MANETs

- Simple Uniqueness Algorithm(Attiya, 1990)

  -required name space of size N=(n-t/2)(t+1)

  -keeps names unknown in vector(i.e, ordered set)

- To adapt this algorithm for MANETs:

  -broadcasting throughout the entire network, achieved simply(but inefficiently) with flooding

  -issue of node failures vs. partitions

Studying the Behavior with a Simulator

- TAMUSim

  - algorithm-level simulator for MANET algorithms

  - currently under development in Welch's research group

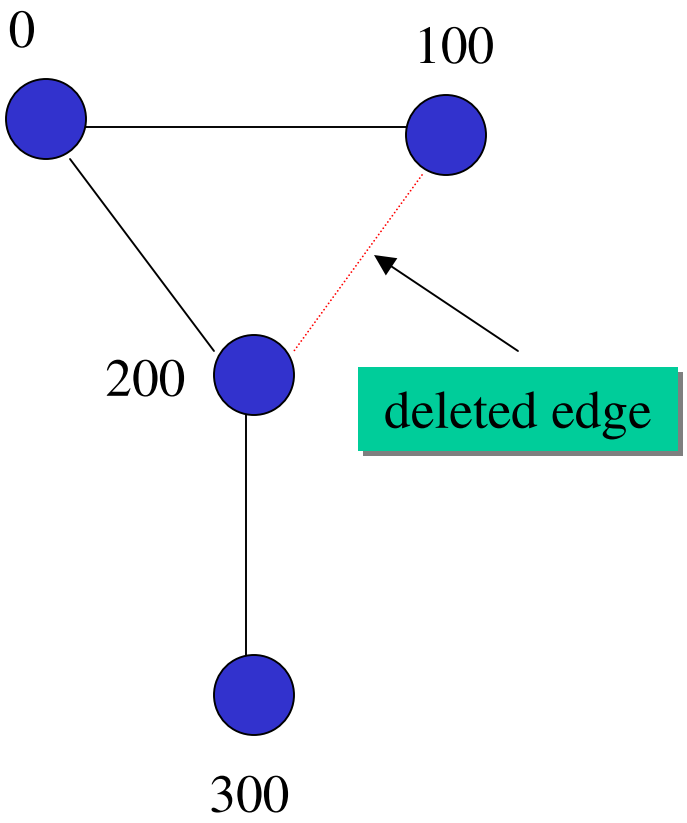
  - designed to facilitate understanding qualitative, not quantitative, behavior of algorithms

  - help develop correctness proofs

  - automate the construction of possible counter-examples

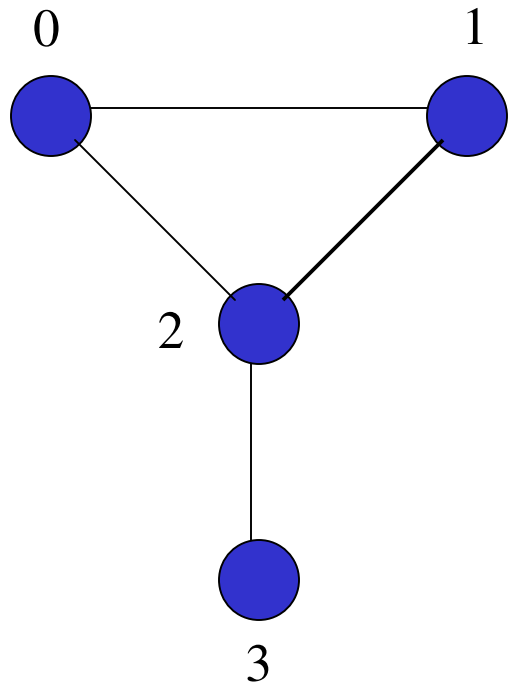
Simulation Results

- Nodes with starting id's before new id is chosen
- Number of messages is dependant upon the number of nodes.
- Update messages are sent to both nodes that share an deleted edge, but what happens to the algorithm?



Simulation Results(2)

- Nodes with ending id's after choosing a new id
- New names distinct from each other(Attiya, 1990)
- Use of short names reduces complexity of messages(Attiya, 1990)



Conclusions and Future Work

- Flooding is too inefficient
- May need radically different approach to deal with MANETs, and tie it in with applications
- For future work:

  - develop and prove correct a renaming algorithm that works efficiently in MANETs

  - enhancements to the simulator:

    - implement node mobility

    - implement dynamic automation for simulations