PRoPHET Update

draft-lindgren-dtnrg-prophet-02.txt

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Introduction

- Routing protocol for intermittently connected networks
  - Based on the use of *delivery predictabilities*, a metric that estimates the suitability of a certain node as a forwarder for a destination.
- Previous version presented at Paris IETF
- Focus on changes and new events in this presentation

Changes from -01

- Restructuring of the document to make it easier to read and use as reference when implementing.
  - Based on comments from implementors and external readers.
  - State tables added for various parts of the protocol to aid implementors.
  - Clearer separation between specification of message formats and the detailed operational description of how they are used.
  - Clearly specifying what is required from lower layers.
  - Removed various minor nits and ambiguities.
- Added optional optimizations/improvements regarding the treatment of delivery predictabilites
  - Averaging of delivery predictabilities to get smoother development over time.
  - Removal of very small values to reduce overhead.

More changes

- Neighbor discovery moved out from protocol
  - Allow protocol to use whatever neighbor discovery method that might be available on the network technology used.
  - If not available from lower layers, a beaconing neighbor discovery mechanism can be used (example given in appendix).
  - Can for example help save power (c.f. throwboxes)
  - Link up/down events from BF in new architecture?
- Security considerations section added
  - Discusses possible attacks on the protocol and possible approaches to solve them.
  - No conclusive solutions.
  - Should look more into the bundle security draft to use the same terminology.

Implementation Status

- Lego MindStorms implementation
  - Very successful demo at MobiCom 2005
  - CDs with cool videos available for interested people
  - http://www.sm.luth.se/~dugdale/mobicom2005_final.avi
- Draft compliant implementation in OmNet++ simulator.
- Linux implementation in progress
  - Expected to be finished in June.
- Jeff Wilson?
- New architecture presented this morning seems promising

Future Plans

- Improved operation in partly connected networks and at high connectivity spots
  - Different options being explored.
- Real life deployment test (within SNC) this summer
  - Pilot deployment in the Laponia region in the north of Sweden to be done within the Saami Network Connectivity project.
  - August 2006
  - PRoPHET will be used for routing
  - E-mail, web caching used as applications
  - Lab environment testing to prepare for this in June/July
  - Anybody interested in field testing their applications are more than welcome to join us.

Some other related work at LTU

- Creation of mobility and contact pattern models
  - Lots of simulations using random way-point or something else non-real
  - Recently more people feed real traces into their simulations
    - Good, but number of scenarios limited by the number of traces collected
  - Create models based on real traces, and use those in simulations
  - Not interested in models of mobility (i.e., position), but contacts
  - RealityMining, Haggle data sets
- Creation of interactive GUI tool for study of DTN trace properties
  - Explores topological and dynamic properties of the contact traces.
- Johan Nykvist (johan@sm.luth.se)