Inter-MANET Routing

IETF-105, Ronald in ’t Velt, TNO
How to connect (heterogeneous) MANETs?

• Multiple MANETs
  • Potentially running different MANET routing protocols
  • Potentially using different radios (L1/L2) for internal communication
    • but within each MANET a subset of the nodes is equipped with an additional ‘common’ radio / waveform type for Inter-MANET communication
  • Forming a ‘coalition’ or ‘federation’

• Think large scale multi-party disaster recovery operation
  • The usual euphemism 😊
Everything moves

• Individual MANETs may split and merge
Gateway nodes

- Nodes with both an internal and a ‘common’ radio are potential gateways
- Gateways can be pre-configured or dynamically selected
- Gateways run two (or more) different MANET routing protocols
  - How to convey routing information from one MANET routing protocol to another?
    - ‘Flat’ route redistribution is one possible solution, but is hard to configure and loop-prone
    - A specific Inter-MANET protocol may be the way to go
      - Analogy: Autonomous Systems connected by an Exterior Gateway Protocol; hence ....
‘EGP for MANETs’

• BGP is not suited for the job
  • Cannot handle frequent splits and merges of ‘Autonomous Systems’ (MANETs)
    • There is no address aggregation in MANETs
  • Runs over TCP; in MANETs, TCP connections are often unstable

• The need for a MANET ‘EGP’ has been argued in a number of scientific papers, along with some solutions
  • But ‘implementations’ were largely done in simulation frameworks (ns-2, OPNET) and are unavailable
Literature

• C.-K Chau et al., Inter-domain routing for mobile ad hoc networks, in 3rd International workshop on Mobility in the evolving internet architecture, 2008

• S.H. Lee et al., InterMR: Inter-MANET Routing for Heterogeneous MANETs, in The 7th IEEE International Conference on Mobile Ad-hoc and Sensor Systems, 2010

• Joy Na Wang et al., Inter-domain Routing for Military Mobile Networks, Milcom 2015

• .....
Question to the WG

• Is there interest to work on an Inter-MANET Routing Protocol?
  • Write a Problem Statement
  • Study existing proposals and establish what is missing (if anything)
  • Write a protocol specification
    • Probably aiming at ‘Experimental’ initially
  • Work on an implementation(?)

• If yes:
  • Do we need to re-charter to accommodate this work?