

OSPF and MANET WG meetings, IETF63

OSPF MANET Design Team update

August 1-5, 2005

Tom Henderson (in absentia)
{thomas.r.henderson@boeing.com}

1

A brief history

- MANET WG standardized a set of Experimental RFCs
- Initial problem statement drafted
 - draft-baker-manet-ospf-problem-statement-00 (expired)
- Initial drafts on an OLSR-like adaptation of OSPF, and database exchange optimizations
- WG decides to charter a design team (2004)
 - Meetings in San Diego and Washington, and design-team mailing list

2

Problem statement

1. Focus on OSPFv3 and not OSPFv2
2. Compatibility with non-wireless OSPFv3
3. Intra-area extensions only
4. Not focusing on transit network case, but should not be precluded
5. Scaling goal is 50-100 nodes on wireless channel
6. Leverage existing MANET work where possible
7. Use RFC 3668 guidance on dealing with IPR claims

3

Consensus reached so far

- Working on defining a new MANET **interface type** rather than a MANET **area type**
 - in parallel with existing OSPF interface types
- Focusing first on designing an **optimized flooding mechanism** for new LSA generation
 - using acknowledged (reliable) flooding
 - use Link Local Signaling (LLS) hello extensions
- Focus on two active I-Ds
 - draft-chandra-ospf-manet-ext-03.txt
 - draft-ogier-manet-ospf-extension-04.txt
- **New complementary draft:**
 - draft-roy-ospf-smart-peering-00.txt

4

Draft overview

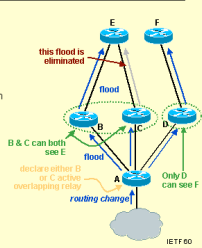
- Both drafts focus on selecting more efficient Relay Node Sets (RNS) for flooding
 - A "Connected Dominating Set" (CDS)
- Differences
 - Source Independent vs. Source Dependent CDS
 - Use of Hellos or LSAs for dissemination of two-hop neighborhood information
 - Differential (Incremental) Hello implementations
 - Ogier draft proposes reduction of adjacencies formed in dense networks

5

Review of draft-chandra*

Optimized Flooding

- Find common "two hop" neighbors
 - Group neighbors based on their neighbor sets
- Calculate minimum set of overlapping relays
 - Pick one neighbor from each group of neighbors with the same "two hop" neighbors
- Signal overlapping relays to flood LSAs
- Remaining neighbors do not re-flood learned information (they backup the active overlapping relay)



draft-chandra-ospf-manet-44011.txt

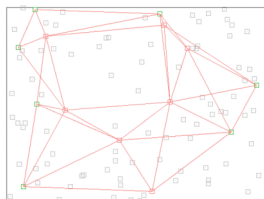
* from Proceedings of OSPF WG, IETF-60

6

Review of draft-ogier*

Simulation in Mobile Networks (cont.)

Biconnected backbone consisting of DRs (red) BDRs (green), and adjacencies between them (red lines).
Computed by Essential CDS algorithm.

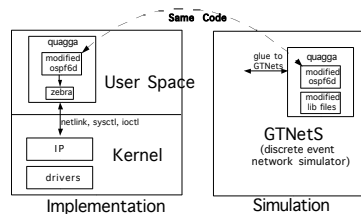


* from Proceedings of OSPF WG, IETF 62

7

Design team evaluation software

- Based on quagga open source OSPFv3 routing daemon
 - <http://www.quagga.net>
- Runs as Unix implementation, or as GTNetS simulation (same quagga code)
 - <http://www.ece.gatech.edu/research/labs/MANIACS/GTNetS/>
- Implements both drafts



8

Simulations conducted by Boeing (1)

- Criteria for evaluation include:
 - overhead due to flooding
 - overall OSPF overhead
 - data packet delivery ratio (forwarding performance)
 - scalability trends
 - run-time complexity of algorithm
- Simulation code and documentation shared with design team members
 - Richard Ogier developed and fine-tuned his proposal's implementation

9

Simulations conducted by Boeing (2)

- Simulation results indicate
 - both drafts perform comparably when looking at flooding optimizations
 - Ogier's draft takes an extra step to reduce unnecessary adjacencies
 - leverages shared CDS backbone to do this
 - combined overhead savings (and scaling improvement) are substantial
 - Recent "Smart Peering" draft by Roy et al. attempting similar topology optimization
- See (forthcoming) technical report for details

10

Next steps

- Design team struggling to reach consensus on a single recommended approach
- Proposed to run one more meeting cycle
 - Open discussions also on OSPF and/or MANET WG mailing lists, if there is interest
 - (issue: cross-posting??)
- Boeing in process of releasing technical report, reference implementations (and simulator)
 - plan to announce to list

11