AODV Improvements

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http://www.svrloc.org/~charliep/txt/ietf45/aodv.ps

Service Location Extension

Uses same RREQ/RREP framework for locating services.

Identify service by protocol/port numbers.

Lifetime of association between service and IP address is typically far greater than the lifetime of any route between a client and the node hosting the service.

A node *must* have a valid route to the IP address hosting the service before answering a RREQ for the service.

The RREQ for locating services has a new 'S' bit, and the 32-bit destination IP address field is then interpreted as a protocol field and a 16-bit port number.

Recent Simulation Experience

Problems identified:

- Congestion occurs unexpectedly soon
- Major problem: long queues
- Major problem: 802.11 RTS/CTS collisions with long data packets coming from hidden terminals

Simulation Results

- DSR presents less routing load as a result of aggressive caching
- AODV offers typically better throughput, delay, especially at higher traffic load
- DSR works better at low mobility, because AODV then unnecessarily throws away valid routes.

Other Strategies for Improvement Identified

Expanding rings search: has been specified for recent draft revision.

Query localization/local repair will be specified real soon now.

Multicast Operation Changes

- Merge of disjoint trees after a network partition
  - Group Leader with lower IP address (GL1) is only node able to initiate repair
  - Unicasts RREQ with set 'R' flag to other Group Leader (GL2)
  - If node on GL2's multicast tree receives RREQ, it MUST forward RREQ along upstream link
  - GL2 unicasts RREP with set 'R' flag back to GL1.
  - If node on GL1's multicast tree receives RREP, it MUST forward RREP along link toward GL2. It then changes direction of its upstream link to point towards GL2.
  - All nodes receiving RREP add Enabled next hop entry for multicast tree
  - When GL1 receives RREP, the tree is reconnected

Multicast Packet Field Changes

- Multicast Activation (MACT) Message Update ('U') Flag
  - When node repairs link breakage, it is likely to be new distance from group leader
  - Sends MACT with set 'U' flag along downstream tree links to update neighbors distance from group leader
  - Hop Count is set to new distance from group leader
- Group Hello Multicast Tree Hop Count Extension
  - Incremented whenever received by node not on the multicast tree
  - Zero value
    - Indicates packet has traveled solely over multicast tree links
    - Hop Count used to update multicast tree member distance from group leader

Group Leader Table and Broadcast Ability

- Group Leader Table
  - Formerly Request Table
  - Entries are still Group Leader IP Address and associated Multicast Group IP Address
  - Table is updated whenever a Group Hello is received

Broadcast Ability

- Sent to 255.255.255.255
- Each node maintains list of broadcasts received
  * Source IP Address
  * IP Ident header field
- Redundant broadcasts discarded