

AODV Patch Performance Comparison

Tested in a modified implementation of manet-routing-compare.cc

Changes include running the experiment simulation five times with different seed numbers, increasing the number of nodes to 75 (per John Abraham's suggestion), and adjusting simulation outputs.

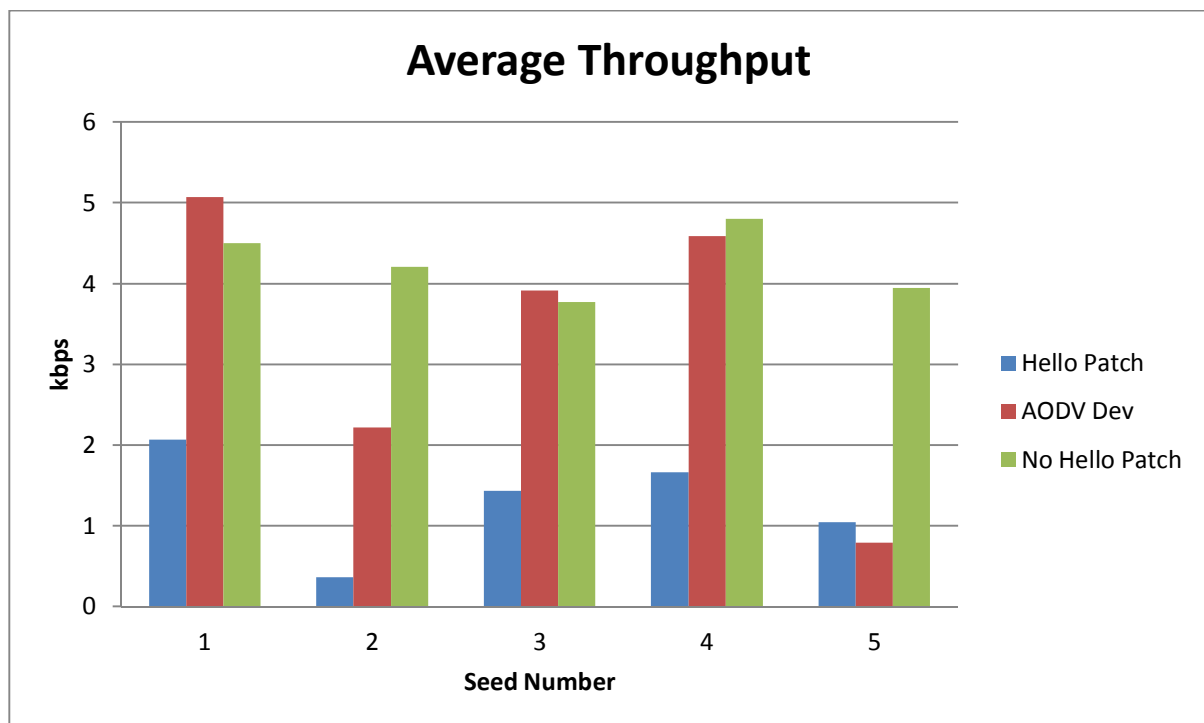
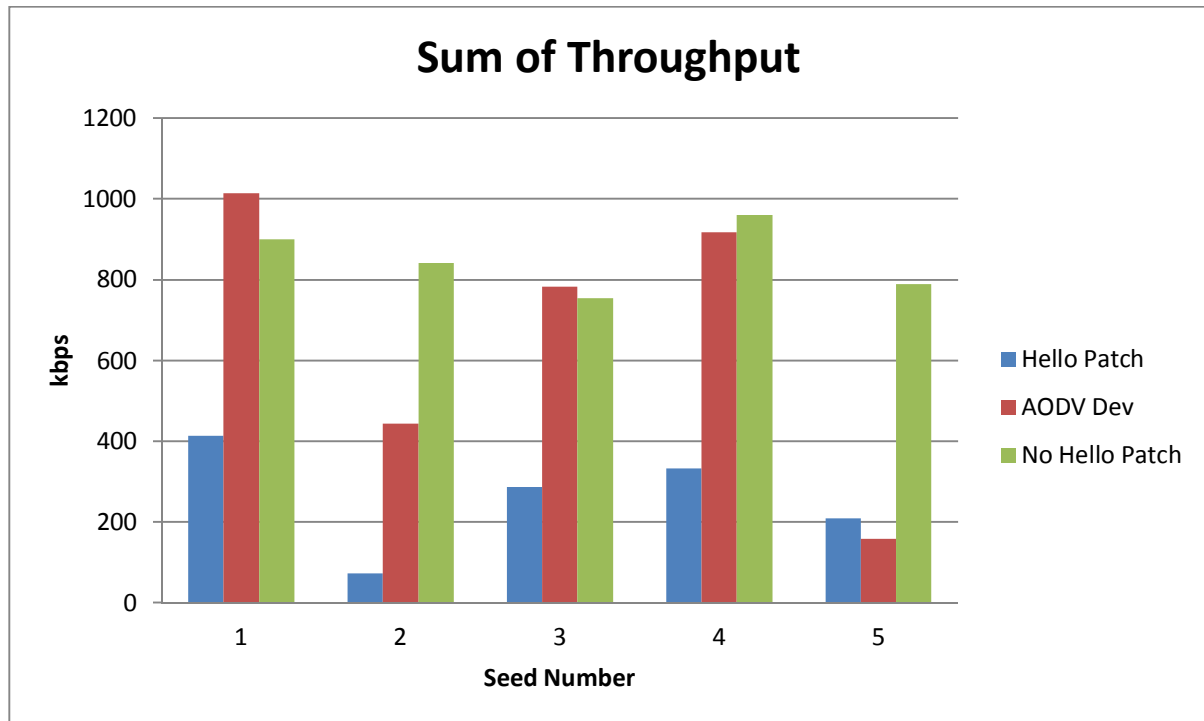
Trials

- 1) Patches for Hello behavior addressing bugs 1190, 1193, 1188 (uploaded to 1190)
- 2) Current AODV behavior in a development version (change set 9694:eb7335c2423c)
- 3) Patches for turning Hellos off by default (bug 1629)

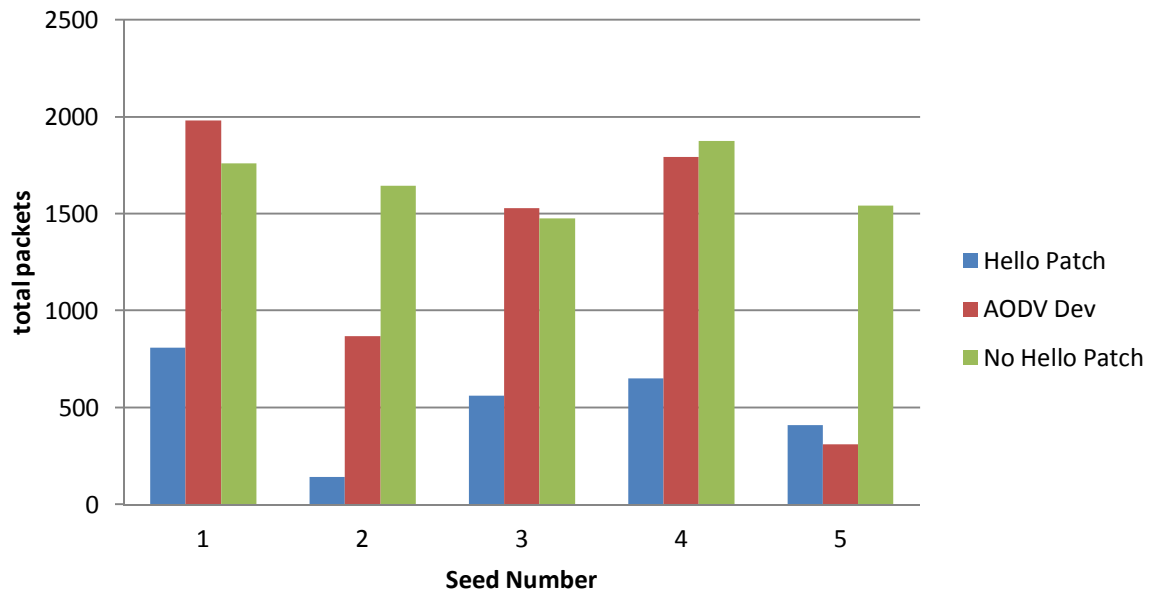
Table of Results

| Sum of Throughput | | | | | |
|-------------------------|----------|---------|---------|---------|---------|
| Trial | Seed | | | | |
| Hello Patch | 414.208 | 73.728 | 287.232 | 333.312 | 210.432 |
| AODV Dev | 1015.296 | 444.928 | 783.872 | 919.04 | 159.232 |
| No Hello Patch | 901.12 | 841.728 | 755.712 | 960.512 | 789.504 |
| Average Throughput | | | | | |
| Trial | Seed | | | | |
| Hello Patch | 2.07104 | 0.36864 | 1.43616 | 1.66656 | 1.05216 |
| AODV Dev | 5.07648 | 2.22464 | 3.91936 | 4.5952 | 0.79616 |
| No Hello Patch | 4.5056 | 4.20864 | 3.77856 | 4.80256 | 3.94752 |
| Sum of Received Packets | | | | | |
| Trial | Seed | | | | |
| Hello Patch | 809 | 144 | 561 | 651 | 411 |
| AODV Dev | 1983 | 869 | 1531 | 1795 | 311 |
| No Hello Patch | 1760 | 1644 | 1476 | 1876 | 1542 |
| Average Received | | | | | |
| Trial | Seed | | | | |
| Hello Patch | 4.045 | 0.72 | 2.805 | 3.255 | 2.055 |
| AODV Dev | 9.915 | 4.345 | 7.655 | 8.975 | 1.555 |
| No Hello Patch | 8.8 | 8.22 | 7.38 | 9.38 | 7.71 |
| Count | | | | | |
| Trial | Seed | | | | |
| Hello Patch | 98 | 44 | 93 | 97 | 73 |
| AODV Dev | 95 | 92 | 100 | 100 | 69 |
| No Hello Patch | 99 | 99 | 99 | 99 | 99 |

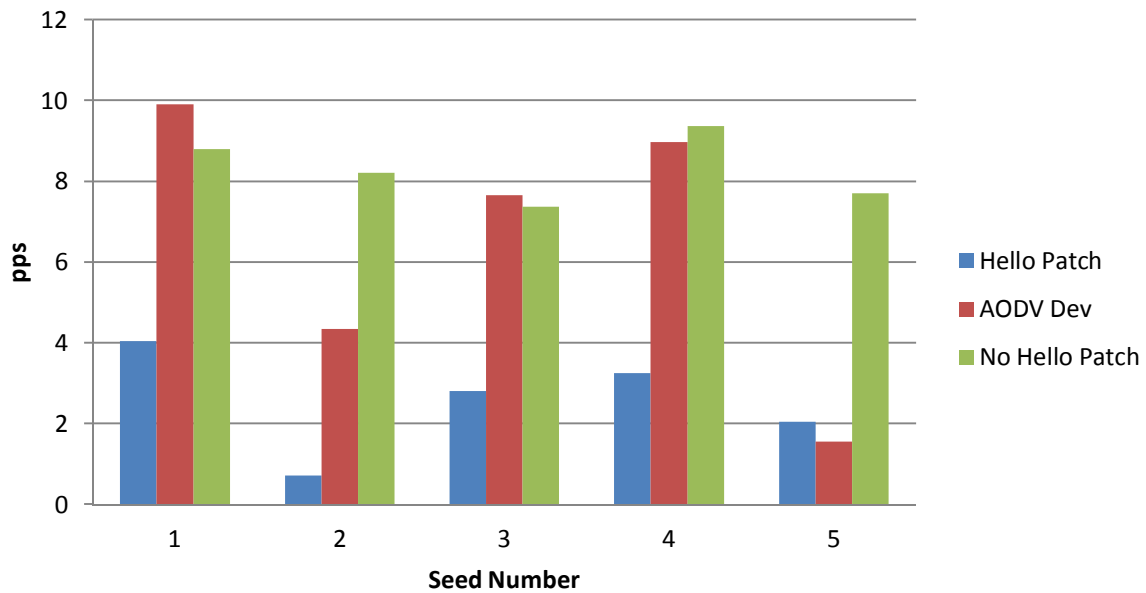
Graphs

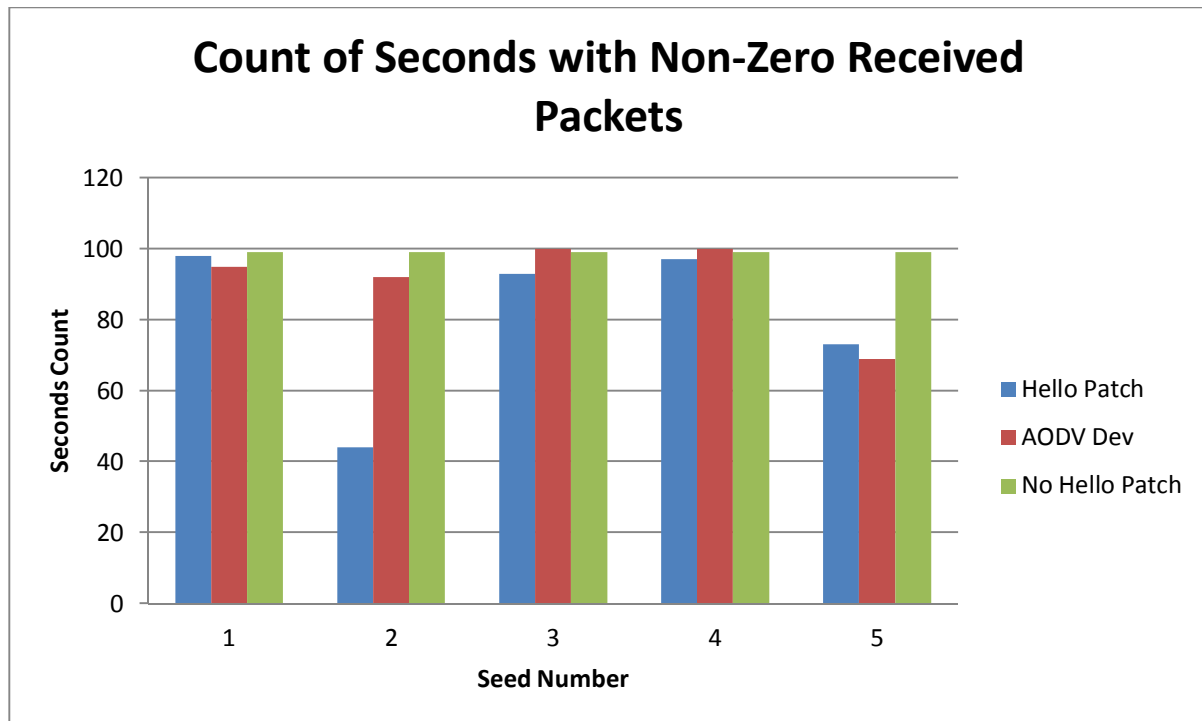


Sum of Received Packets



Average Received





Results

The patches suggested to improve the behavior of the hello component of the AODV implementation did not result in a performance increase in the simulation environment used in the manet-compare-routing example with 75 nodes. Analysis was attempted to determine why, but at this time no conclusions can be drawn.

The patch suggested disabling hellos by default and the performance of the simulation with hellos disabled was very comparative to results from current AODV behavior. In particular performance in the fifth seed was very low across the first two trials, but with hellos disabled the performance remained very high. Also, disabled hellos performed better than the current AODV behavior in the second seed.

A side benefit of disabling hellos is that less overhead is generated by the routing protocol. In the first two trials the five simulations took over an hour to complete, whereas with hellos disabled the five simulations completed in less than five minutes.

Conclusion

At this time it may be beneficial to improve the performance of the AODV implementation by disabling hellos by default. Further testing will need to be conducted before accepting the proposed patches to improve the behavior of the hello component in AODV.