Wireless Networking Lab 3: Comparison of DSR and AODV Routing Protocols

Introduction

This assignment aims at making the students familiar with the reactive (on-demand) routing protocols used in ad hoc networks and compare the performance of DSR and AODV protocols.

Performance Metrics used

We will evaluate the routing protocols in terms of two metrics-
1. Packet Delivery Fraction/Ratio : It is the ratio of packets delivered to that transmitted by the source at the AGT level.
2. Routing Load : It is the number of routing packets sent per data packet delivered.

NS2 Instructions

- 1. Get the tcl script compare.tcl
- 2. This script, "compare.tcl" takes 4 command line arguments - scenario file, traffic file, output trace file and routing protocol(1 = DSR and 2 = AODV). Script usage is :

  ```
  $ ns compare.tcl -scen {scen} -tfc {tfc} -tr {tr} -rpr {rpr}
  ```

  This script requires, a (i) Scenario file and a (ii) Traffic file. These files can be generated using third party tools which are now part of the NS2 installation
- 3. The usage of third party tools setdest and cbrgen.tcl was explained in class. Use these to create your scenario and traffic files. More details are explained below. These are specific to Jabara Hall machines.

  cbrgen

  $ns /usr/local/lib/ns2-indep-utils/cmu-scen-gen/cbrgen.tcl -type cbr -nn 10 -seed 2 -mc 8 -rate 0.25 > cbr1

  will generate a cbr traffic file between a random set of nodes from a total of 10 nodes and is stored in a file called cbr1

  setdest

  /usr/local/lib/ns2-indep-utils/cmu-scen-gen/setdest/setdest -v 1 -n 10 -p 2 -M 10 -t 20 -x 100 -y 100 > scen1

  and creates a scenario file with 10 nodes.

Now run the simulations using the created trace files to find the two metrics of packet delivery ratio and routing load.

Use these specific parameters in your tcl file. You will have to set them. These may not be the setting on the default file given. Also ensure that the scenario and traffic files you create match these values.

X-dimension 500

Y- dimension 500

Simulation time 50 seconds

Specify that 20 flows be created (mc parameter to cbrgen).

You may use the motion parameters in example above except X Y dimension and number of nodes.

Create scenario files, and traffic files as mentioned above for 10, 30 and 50 nodes. Open the traffic files created each time and change the flow start times to 0 for all connections instead of the random start times used. If this is not done, all flows may not be on during simulation time.

Create one line plot comparing AODV and DSR for packet delivery ratios. Have number of nodes on x-axis and packet delivery ratio on y-axis.

Create one more plot for routing load.

Hand In

1. The plots
2. You comments about each plot on the performance of AODV and DSR. Talk about what you observe based on increasing number of nodes.