

Assignment 1. Peersim and gnuplot

If not already done download Peersim from <http://peersim.sourceforge.net> and download and install gnuplot from <http://www.gnuplot.info>.

1.1 Gossip Averaging

1. Run the cycle based gossip averaging example (`example/config-example1.txt`) with the `LinearDistribution` initializer control with `min=0` and `max=100` for the network sizes 500, 5000 and 50000. Collect the results from each run and plot the variances of each run together in one single window (see hints below). What does the result tell us about the gossip averaging protocol?
2. Run the event based gossip averaging example (`example/config-edexample.txt`) with the `LinearDistribution` initializer control with `min=0` and `max=100` for the network size 1000, using
 - at first `MINDELAY`, `MAXDELAY`, `DROP = 0`
 - and then `MINDELAY=50`, `MAXDELAY=100`, `DROP=0.5`

and compare the results.

3. **Bonus Question** If something is different, why?

1.2 Gossip Minimum

Using the source code from the averaging example, implement a protocol which calculates the minimum instead of the average:

1. as a cycle based protocol and
2. as an event based protocol.
3. Do the same evaluation with these protocols as in 1.1.2 and compare the results of gossip averaging with the gossip minimum calculation.
4. **Bonus Question** If something is different, why?

Hints

Set your java classpath to include the Peersim directory and the folder where you

plan to solve the assignments. This way you don't always have to provide the parameters `-cp <peersim files>` to java.

If you are using a UNIX like system you can put the following line

```
alias peersim="java peersim.Simulator"
```

in your `~/.bash_profile` file to be able to execute the Peersim simulator with the shorter command `peersim`.

Gossip Averaging and Peersim

You might want to have a look at the tutorials

- <http://peersim.sourceforge.net/tutorial1/tutorial1.pdf>, and
- <http://peersim.sourceforge.net/tutorial2/tutorial2.pdf>.

for a better understanding of the example source code and the averaging algorithm.

Gnuplot

The output of peersim is in general ready to be plotted using gnuplot without further processing. If you e.g. evaluate a protocol with 500, 5000 and 50000 nodes and write the results from Peersim's `stdout` in the files `n500`, `n5000` and `n50000`, you can plot all of them in one window (and showing only the x interval `[0,5]`) using the following gnuplot command:

```
gnuplot> plot [0:5] "n500" using 2:7 title "n=500", \ >"n5000" using  
2:7 title "n=5000", \ >"n50000" using 2:7 title "n=50000"
```

Using the `AverageObserver` control the output of the Peersim simulator contains in column 2 the number of the current iteration step and in column 7 the variance.