CS439 – Wireless Networks and Mobile Computing Spring 2015 Project on Traffic Modeling Professor: Maria Papadopouli

Consider the trace file "Syslog_data.txt" which contains a list of events that have occurred in a wireless network during a specific time interval. Each line in this file corresponds to a specific event and contains the following information in the respective columns:

1. Timestamp of the event (in milliseconds from 1970).
2. ID of the AP at which the event took place (each AP has been mapped to a unique ID).
3. ID of the customer that initiated the event (each MAC address has been mapped to a unique client ID).
4. Type of syslog message (it can take the values VxW and IOS).
5. Event type (it can take the values Authenticated, Associated, Reassociated, Roamed, Deauthenticated, Disassociated, Rebooted).
6. Reason for which the event took place.

Part A

Import the file "Syslog_data.txt" into matlab using the commands:

fid=fopen('Syslog_data.txt');
C = textscan(fid, ' %d %d %d %s %s %*[^\n]');
fclose(fid);

Select the second column and find all different AP IDs that appear in this column. Tip: you can use the matlab command "unique".

Consider all APs, one by one, and separate the events that correspond to that AP. Then, keep only the events of type "Associated".

Tips: it would be useful to map event types into event IDs. For example, you can map the event type "Associated" to the ID 1, the event type "Authenticated" to the ID 2, etc. You can perform this mapping using the command "unique" (Check the third output element).
Read Tutorial 2 (http://www.csd.uoc.gr/~hy439/labs/Tutorial_2.m), it may be helpful.

The events that you have selected correspond to the arrivals of new users at each AP. Assume that these arrivals are described by a Poisson process (http://en.wikipedia.org/wiki/Poisson_process). Estimate the parameter of this process that best fits the data. Plot the cumulative distribution function (CDF) of

the estimated parameters for all APs. Ignore all APs at which less than two arrivals take place.

Part B

Separate the "Association" events of all APs (together). These events correspond to the arrivals of users at all APs of the network. Assume again that these events are described by a Poisson process. Estimate the parameter of this process that best fits the data. Compare the estimated parameter with the parameters estimated in Part A.

Part C

Take 10000 samples from the exponential distribution that describes the inter-arrivals in the Poisson process of Part B. Plot a histogram and the CDF of these samples. Tip: to generate the 10000 samples, you can use the matlab command "exprnd".

General instructions

You should submit your matlab code with sufficient comments and a report explaining your results.