CS 4251/6250 Computer Networks, Fall 2021

HW1

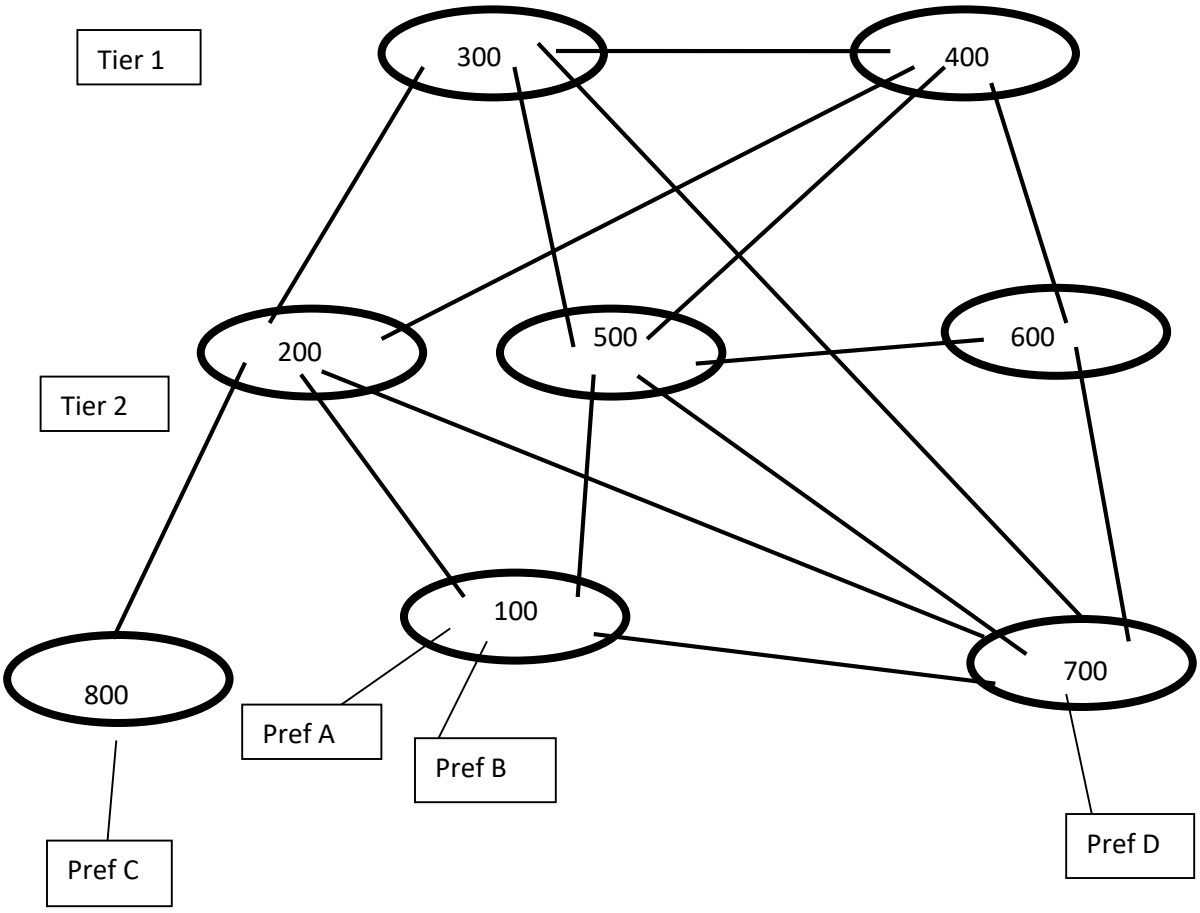
DUE : September 16 at 11;59pm

Submit on CANVAS

HW to be done INDIVIDUALLY

Problem 1

Consider the following AS Graph



a) AS 100 will receive an update for Pref D from AS 700. Will this update be forwarded to AS 200 or AS 500? Why or Why not?

b) How many updates for Pref B will AS 600 receive. List the AS paths for each of them. You should assume that all border routers implement correct import/export policies and will not propagate illegal paths.

c) Which of these paths are illegal? Explain why.

i) 800 200 100 700
ii) 800 200 400 600 700
iii) 800 200 300 500 700
iv) 100 500 600 700
v) 100 500 600 400 300 200 100

d) Show how the following routing policies can be implemented using BGP attributes:
i) AS 700 prefers to *receive* traffic to Pref D from AS 600 except when the source is Pref A or Pref B.

ii) AS 100 prefers to *send* traffic to Pref C through AS 200 and to Pref D directly ro AS 700.

Problem 2

Please see hints and resources at the end of this question before you attempt this problem.

In this problem you will analyze data in from an "oix-route-views" file. To get such a file go to http://archive.routeviews.org/oix-route-views/ then to one of the August 2021 subdirectories. Choose a file from that subdirectory.

a) Tell us which file you picked and describe briefly exactly what type of information is contained in this file.

b) Analyzing the file, list all the IPv4 prefixes that Georgia Tech announces. Compare this with the data in stat.ripe.net. Are there any differences?

c) From the data list the ASes that GT is connected to. Identify AS# and organization/company.

d) *For IP addresses advertised by Georgia* Tech find instances of AS prepending in the data. List at least 5 instances of AS path prepending by GT.

e) Pick a file from the year 1997. Repeat Parts a, b, c and d for this old file.

Hints and Resources:

- The routeviews data is a large file. Don't try to unzip it first. You should use *bzcat* and *grep* to work with it and find what information you need.
- Information about routeviews can be found at www.routeviews.org
- stat.ripe.net is a good resource for learning about ASes