22C: 196: 001 Peer-to-peer Networks
Spring 2010, Assignment 3
50 points

Assigned April 8, 2008, Due April 15, 2008, in class

Question 1. (15 points) Both Chord and Pastry are DHT bases P2P networks, and therefore they have many similarities. Highlight three important differences between these two P2P networks.

Question 2. (10 points) Assume that University of Iowa decides to archive its student records during the past 50 years in Oceanstore, so that they become available in the 22nd century. During this time, many companies owning the servers will go out of business so that theirs storage space will disappear, and in some cases, disgruntled employees of these companies may want to leak / sell the data to make money. How will Oceanstore deal with such issues?

Question 3. (25 points) Recall paper # 34 from the readings list: Fabrikant, Luthra, Maneva, Papadimitriou, Shenker: On a Network Creation Game. ACM PODC pp. 347-351 2003

Assume that the cost of establishing a link (α) = 3, and the cost of using a link is 1 (regardless of who owns it). Which topology reflects the *social optimum* for a system of 6 nodes? Draw it, and compute the total cost of the all the nodes.

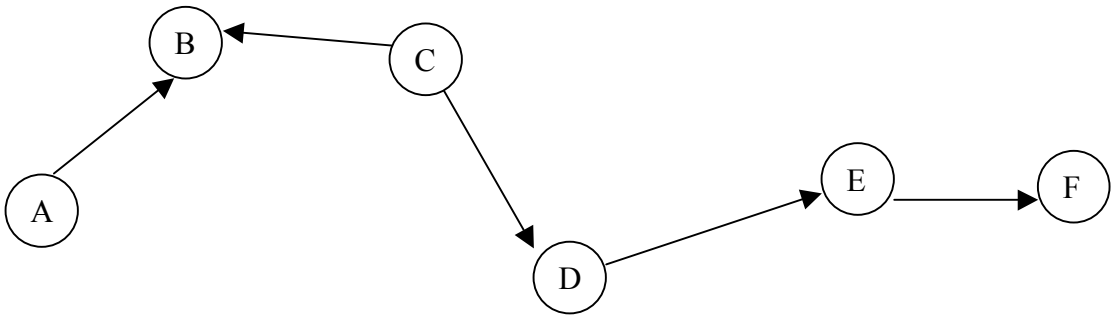

FIG. 1. This is an intermediate network configuration with six nodes A, B, C, D, E, F. Each directed edge from A to B indicates that A paid for that link.

Also, starting from the configuration of Fig. 1, describe a sequence of possible moves by the individual nodes to reach Nash equilibrium.

(a) What is the equilibrium configuration?

(b) What is the total cost of all the nodes in this configuration?

(c) What is the Price of Anarchy here?