Advanced Systems Topics, p2p, Section 3 of 3
– 3 Sample Questions –

Lent Term 2003

Question 1

(a) Hash functions are made much of in Chord and CAN. Look at the typical dimensions of the p2p systems talkedabout in the lectures, and see if you could derive appropriate design for a hash function for one of these. Would multithreaded hashing be a thing to consider at all (think about very fast lookups as with multithreaded web servers!)?

(b) Caching is an important part of improving the performance of p2p systems (e.g. in freenet). Discuss the problems of consistency during update in a caching system.

(c) Concurrency concerns us in any distributed algorithm that updates state. The distributed finger table data structures in Chord are updated when nodes are updated or deleted. Discuss problems of consistency (and appropriate mutex techniques) for these.

Question 2

(a) Discuss the levels of anonimity provided in Freenet. There is a tension between efficiency and anonimity - why is this? [8 marks]

(b) Describe the routing mechanism in Chord, or a similar p2p system. How is update achived in particular [8 marks]

(c) There is a lack of geographic locality in the mapping between content and server ident in Chord, CAN (and Pastry). Discuss the various proposed mechanisms to ameleriorate this shortcoming. [4 marks]

Question 3

(a) The scaling properties of some p2p systems are alleged to derive from "small world" behaviour of users - explain what this means. [7 marks]

(b) been observed that Ad Hoc wireless networks share some characteristics with p2p systems. Which characteristcs? [7 marks]

(c) effect of varying the number of dimensions in CAN. [8 marks]