

Exercise No. 2
Peer-To-Peer Networks
Summer 2008

Exercise 3 *CAN: Fairness*

In CAN the expected amount of data a peer has to store is dependent on the size of its rectangle. Still it may end up with more (or less) data. Calculate the probability, that a node with a rectangle of size $1/n$ has to manage a total share of data of at least c/n , $c > 1$.

Exercise 4 *CAN: Realities & Routing*

Realities can be used in CAN to improve routing, i.e. to decrease the amount of hops required to reach a given destination. Consider a CAN with two realities.

1. Given a random start node n_1 and a target node n_2 in one reality: What is the probability, that the distance between n_1 and n_2 is smaller in the second reality?
2. The probability of decreasing the distance when switching the reality decreases with the distance to the target. What is the distance, where no more switching takes place with constant/high probability?
3. Considering the start and target at a maximum distance: How many reality switchings can be expected to occur?