

22C: 196: 001 Peer-to-peer Networks

Spring 2010, Assignment 1

50 points

Assigned February 9, 2010, Due February 16, 2010, in class

Please submit the answers in a typewritten form. Good documentation is essential. Your solution should only reflect your own thoughts, not someone else's ideas. It is ok to consult other papers, but please cite them at the end of the answer.

1. How will you determine if the topology of an unstructured P2P network satisfies the power-law characteristics?
2. Study the SHA-1 function from any source of your choice. Then visit <http://www.movable-type.co.uk/scripts/sha1.html> It contains a javascript implementation of SHA-1. Use this to look up the keys for your name and write it down in hex
3. A Tapestry network of 2^{16} nodes uses Plaxton routing with a base of 16. Illustrate the primary routing table of a node with key 30AF. Then compute the size of this table.
4. A Gnutella network of 1000 nodes stores an object with population 0.02. What is the expected number of hops needed to locate this object by a single random walker if there is no timeout?
5. How will you determine if the topology of a peer-to-peer network is a small world graph?